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ABSTRACT

The Cooperative Demonstration Program (High Technology) was the largest demonstration program supported under the Carl D. Perkins Vocational Education Act of 1984. The program funded projects to try new approaches, to increase access to high-quality programs for special populations, and to improve the overall quality of vocational education. An analysis of 66 grant applications showed that only 12 applications presented a clear and coherent design for their project, with an additional 26 presenting a moderately clear design. A review of 23 funded projects, conducted through a mailed survey, showed that all grantees were able to accomplish at least part of the activities proposed in their applications. Projects tended to focus on short-term training (fewer than 100 hours). In projects with a large number of private partners, those partners tended to be simply customers of the project's customized training, whereas in projects with fewer partners, those partners tended to share in the design and/or delivery of training. All projects encompassed some aspect of high technology. Projects that did not accomplish all their proposed activities were hampered by their inability to recruit special populations, poorly developed project designs, failed partnerships, and overly ambitious objectives for the project. Per-participant per-hour costs tended to be similar across projects and may be considered reasonable relative to one another. Following the evaluation, recommendations were made for improving the regulations for grant applications, increasing start-up times, and providing prior notification of the types of financial records that will need to be kept. (Nine appendixes describe the projects evaluated and the results of the mail survey. Twelve references and 26 tables are included.) (KC)

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Demonstrating Cooperation: Lessons from Federally-Funded Projects in Vocational Education

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EXECUTIVE SUMMARY

The Cooperative Demonstration Program (High Technology) was established by Congress to support school districts, community colleges, consortia, and private industry in demonstrating new approaches to vocational education. In FY1988, the first year of the program, the Office of Vocational and Adult Education (OVAE), U.S. Department of Education, awarded 36 grants totaling $9.5 million. The following fiscal year, OVAE awarded an additional 30 grants totaling $9.2 million. Although all grantees proposed vocational education training for participants, the type of participants to be trained, the content of training, and the length of training varied widely across projects. Approximately half of the grantees also proposed to develop new vocational education curricula.

An analysis of the grant applications submitted by the grantees showed that only 12 of the 66 applications presented a clear and coherent design for their project, suggesting they would be very likely to be successful in their demonstration. An additional 26 presented a moderately clear and coherent project design, suggesting they might be somewhat less likely to be successful.

All grantees were able to accomplish at least a portion of the activities proposed in their application. Projects tended to focus on short-term training, and the typical participant received fewer than 100 hours of training. In projects with a large number of private partners, those partners tended to be simply customers of the project's customized training, while in projects with fewer partners, those partners tended to share in the design and/or delivery of training. All projects encompassed some aspect of high technology, even if just using high-tech equipment to teach low-tech job skills. Projects that were not able to accomplish all of their proposed activities were hampered by: their inability to recruit special populations, poorly developed project designs, failed partnerships, and overly ambitious objectives for the project (e.g., development of an interactive laser disk). The 18-month time frame for the grant proved too short for projects to accomplish much more than customized training.

Although there is no OVAE standard for "reasonable" costs associated with demonstration projects, the per-participant per-hour costs of training tended to be similar across projects and, therefore, may be considered reasonable relative to one another. The cost for developing new curriculum materials varied widely, depending upon the technology used to present the information.

A. Purpose of the Cooperative Demonstration Program

The Cooperative Demonstration Program (PL 98-524, Title IV, Part B, Subpart 1) was the largest demonstration effort supported under the Carl D. Perkins Vocational Education Act of 1984. The program provided the U.S. Department of Education (ED) and educational institutions an opportunity to try new approaches to vocational education and to learn about the effectiveness of these approaches. Funded projects were to reflect the Act's priorities:

- Increased access to high quality programs for special populations; and
- The overall improvement of the quality of vocational education.

Projects also were to demonstrate successful cooperation among private employers and public agencies that resulted in training in advanced vocational education skills. A variety of models were suggested in the legislation, including work experience and apprenticeship, worksite training, placement, and public works. Eligible applicants included State education agencies, local education agencies, postsecondary educational institutions, institutions of higher education, and other public and private agencies, organizations, and institutions. Of 181 applications submitted in FY1988 (the Programs's first year), 36 were approved and awarded grants ranging in size from $50,000 to $550,000. In FY1989, 136 applications were submitted, and 30 were awarded grants ranging in size from $171,874 to $473,549.

All projects had to serve people enrolled in vocational programs directly and be widely replicable by service providers. Furthermore, grant recipients had to provide, through cash or in-kind contributions, a minimum of 25 percent of the demonstration project's total cost. Contributions could include the fair market value of facilities, overhead, personnel, and equipment.

In addition to the priorities contained in the Act, each year the Secretary of Education had the prerogative to establish additional priorities for the program. In the first year of the program (FY1988), an invitational priority was issued by the Secretary for projects addressing high technology, but not all projects funded in FY1988 responded to the invitation. Of the 36 grants awarded, OVAE identified 23 as being "high technology," based on either the type of job for which training was conducted (or a curriculum developed) or the nature of the training given students. These 23 projects were the focus of the first-year evaluation effort. In FY1989, high-technology was made an absolute priority and all 30 projects funded in FY1989 addressed high-technology issues.

B. Findings of the Evaluation

This report presents the findings from an evaluation of high-technology projects funded by the Cooperative Demonstration Program in FY1988 and FY1989. The evaluation answered three important questions:

- Did the grant applications present a clear and coherent design for a project?
- Were the grantees able to implement their projects as proposed, and, if not, what problems affected their implementation?

- Were project costs reasonable in relation to projected or actual outcomes?

The answers to these questions are presented in separate sections in the report and summarized in the following paragraphs.

Clear and Coherent Project Design

Of the 23 FY1988 applications analyzed, only three presented a clear and coherent design for a project while an additional ten were moderately clear and coherent in their design. These applications were judged to be, respectively, highly likely and moderately likely to be successful. The remaining ten applications were much less clear in their design and, accordingly, judged much less likely to be successful.

The quality of the awarded applications improved in the second year of the program. Of the 30 FY1989 applications reviewed, nine presented a clear and coherent design, while an additional 16 were moderately clear and coherent in their design. The remaining five applications were much less clear in their design and judged less likely to be successful.

Project Implementation

The evaluation focused on five aspects of project implementation: project training, public/private partnerships, the involvement with high technology, the operation of the project within the grantee institution, and the replicability or "exportability" of the projects activities and products.

Project Training. Overall, projects focused on providing relatively short-term training. The typical participant received fewer than 100 hours of training. The projects included in the site visits can be grouped into a few basic categories:

- Short-term, skill-specific instruction for current employees of companies, or for persons already familiar with the field of training. This approach was most common among manufacturing projects, but it could also be seen in the refresher nursing course and in business projects teaching specific software applications, as well as home automation installation. Sometimes instruction was customized, tailored to the needs of specific employers.

- Medium-term, entry-level technician training. These were programs in which training ranged from a few months to a year, often aimed at helping unemployed or otherwise disadvantaged persons find jobs in a field. These programs cut across the industries but were quite common in business. The three projects run by JTPA-supported agencies fell within this category, one of which provided training in several fields. Some provided certificates.

- Longer-term programs aimed at two-year certification or degrees (associate degree, license). Some of these projects were aimed at institutional capacity-building and regular students, e.g., creating new or revising existing offerings within departments of industrial technology or business/computers in community colleges. One was an apprenticeship training project, and one an occupational program for high school students.

Partnerships. Among projects included in site visits, intensities of partnerships varied from two projects where single employers played critical roles in service development and delivery, to several projects in which employers did little more than attend meetings of an advisory committee. According to survey results, most partnerships fit one of two models:

- The partner was a customer of the project, e.g. the project provided customized training to the partners' employees; or

- The partner shared actively in the delivery of instruction and services.

Projects with multiple partners were considerably more likely to report that partners were customers, while projects with few partners used partners in more ways, including active sharing of instruction.

High Technology. Initial concerns that projects might not have a high-tech focus do not appear to be have been reflected in practice. This is true primarily because almost all fields have some high-tech elements. If learning to operate high-tech equipment is included as a training option, requiring that the project be high-tech in focus excludes almost no training effort.

Operation and Integration of Projects within Institutions. FY1989 projects reported fewer start up problems than did FY1988 projects. The 18-month time frame continued to present problems in completing project activities however. Whether a project started providing services shortly after award made little difference in whether it continued after the grant ended. The site visit teams identified several problems that cut across projects. They included: an inability to recruit special populations as planned, problems in getting and maintaining plant and materials, poorly developed designs that could not be executed, and underestimating the time necessary for product development. Aside from the recruitment difficulties, most problems were resolved but had an impact on those projects' ability to complete work within the 18-month grant time frame. The poor economy did not affect the majority of projects--especially projects in industries such as health care where the conditions may not have been as bad.

Exportability of Project Activities and Products. Survey results suggested that projects lacked consensus on what it was that the Cooperative Demonstration Program was "demonstrating." Only 20 projects considered their public-partnerships, and only 13 projects considered their training, as applicable to, or providing a useful model, for others. Site visits revealed that most projects simply did not conduct the kinds of evaluations that would allow possible replicators to determine whether the project was successful for participants. Projects that developed and tested discrete curricula or products were more likely to have some evidence of effectiveness and a product to disseminate.

Project Costs

Ideally, the evaluation would determine cost effectiveness by matching costs to specific activities and outcomes. However, the study team was not able to collect cost data for each outcome separately for two reasons. First, grantees did not code expenditures by activity because their accounting system did not operate at that level of detail, i.e., expenditures were aggregated only according to budget line items. Second, several activities usually contributed to the same outcome--projects implemented activities or one activity was used to support more than one objective.

The team analyzed the three activities for which cost data were available through the grantee's accounting system or the final contract budget: planning and administration, student training, and curriculum development. Planning and administration costs include wages of the project director and clerical staff, associated fringe benefits, other direct costs associated with administration, and indirect costs. Student training costs include the wages of instructors and other specialists, associated fringe benefits, other direct costs (e.g., textbooks, supplies, travel, and stipends), and indirect costs. Curriculum development costs include the wages of instructors and curriculum development specialists, associated fringe benefits, other direct costs (e.g., training workshops, travel, and printing), and indirect costs.

Treatment Costs. The first major analysis separated planning costs from the costs of providing the service. Treatment costs equal total costs less planning and administrative costs:

Treatment Costs = (total project costs) - (project director wages + clerical wages + fringe benefits + other direct costs + related indirect costs)

The proportion of total project resources devoted to planning and administration ranged from 9.5 percent to 48.0 percent. The mean proportion of resources was 23.5 percent, and the median proportion was 28.8 percent.

Project Intensity. The intensity of the project (i.e., the number of successful outcomes relative to the effort expended to accomplish those outcomes) is defined as:

$$\textbf{Project Intensity} = \frac{\text{total treatment hours}}{\text{number of successful completions}}$$

The effort to train students was the sum of the hours students spent in training in all courses. The number of successful outcomes was the sum of the students completing training. In projects where the treatment was staff training, the number of successful outcomes was the number of teachers completing training. Project intensity for each activity for which data were available--training students and training staff--ranged from 16.92 hours to 7,000 hours. The mean intensity of student training was 1,239 hours, and the median intensity was 3,508 hours. Staff training, offered formally at only three sites, ranged from 20 hours to 53.5 hours per teacher. The mean number of hours per teacher was 38.8 and the median number of hours was 36.8.

Average Unit Cost of Services. The average cost per unit of service is the total cost of the service divided by the number of units provided:

$$\textbf{Average Unit Cost of Service} = \frac{\text{total treatment cost}}{\text{total units of service provided}}$$

For example, total service costs for providing student training was the sum of the project costs for staff, materials, overhead, etc. for all the courses. Total service costs for curriculum development was the sum of project costs for staff, testing, reproduction, overhead, etc., for all the courses produced. Total units of service provided was the sum of all students entering training or the number of new courses.

The average unit cost for student training ranged from $.45 to $40.47. The mean average unit cost for student training was $27.59, and the median average unit cost was $20.46.

Comparing the average cost-per-hour-of-training across projects may create an unfair comparison because of variations in the intensity of the training and the number of students being trained. These differences affect the comparison of costs for curriculum development. The average unit cost for curriculum development (cost per course hour) ranged from $1.69 to $24,179.90. The mean average unit cost for curriculum development was $2,613.24, and the median average unit cost was $12,090.79. However, comparing the average cost-per-unit-hour for curriculum development also may be misleading. One project's course was an interactive videodisc, which had a much higher initial development cost due to the technology used.

To provide a more accurate comparison, the analysis should compute the average cost per hour of training per student trained.

$$\textbf{Average Unit Cost of Service per Unit of Outcome} = \frac{\dfrac{\text{total service costs}}{\text{total units of service provided}}}{\text{number of completers}}$$

The per-hour per-student costs range from $.001 to $9.24. The mean per-hour per-student cost was $1.95, and the median per-hour per-student cost was $4.62.

Service Cost Per Unit of Outcome. The service cost per unit of outcome is defined as total service costs divided by the number of completions:

$$\textbf{Service Cost per Unit of Outcome} = \frac{\text{total service costs}}{\text{number of successful completions.}}$$

The number of successful completions is defined as the sum of the students completing the training and the number of courses successfully developed. The unit service costs for training students ranged from $190 to $62,971. The mean unit service cost for training students was

$8,695, and the median unit service cost was $31,580. For curriculum development, the cost per course ranged from $233 to $241,799. The relatively high cost at one project again was due to the high cost of the interactive videodisc. The mean unit service cost for curriculum development was $41,908, and the median unit service cost was $121,249.

In summary, the answer to the question "are project costs reasonable in relation to project outcomes?" appears to be yes for all projects. Neither OVAE nor the literature of vocational education have defined the absolute cost standards against which to measure "reasonableness" of demonstration activities such as training or curriculum development. Thus, it is not possible to conclude that project costs were either reasonable or unreasonable in an absolute sense. However, the fact that the per-unit and per-outcome costs for the 19 independently-operated projects tended to cluster in the same area (even though total costs and project intensity varied substantially) suggests that project costs were reasonable relative to one another.

C. Lessons for Federal Program and Demonstration Management

Although the Cooperative Demonstration Program (High Technology) has ended, the evaluation of the program has yielded important lessons that can be applied to future demonstrations sponsored by OVAE and the Department. The information obtained from the 27 FY1988 and FY1989 grantees visited by the study team and the 30 FY1989 grantees surveyed suggest ten lessons regarding project design, project implementation, and project costs. These lessons are presented in the following paragraphs, organized according to the three evaluation topics: project design, implementation, and costs.

Lessons Regarding Project Design and Presentation in the Grant Application.

Lesson 1: Program regulations should be more narrowly defined to convey explicit information about the kinds of interventions sought.

Although titled "Cooperative Demonstration Programs," the authorizing legislation did not narrowly define the nature of the demonstration. It was not clear whether the funded projects were to demonstrate that a particular program can be successful if it has not been tried before, can be improved in its original site if already operating, can be successful in a new site if already implemented elsewhere, or some combination of these intentions. The broad definition of acceptable interventions allowed a wide variety of projects to be funded. Although all projects satisfied the general conditions of the program's regulations, it is uncertain whether all projects met the intent of the regulations and the Perkins Act. For example, was a grant to a single company to retrain its current employees a legitimate purpose under the program? OVAE should state whether the demonstration is to field test previously identified public/private partnerships or to develop new models of replicable partnerships. Similarly, was a project using high technology methods (e.g., interactive video or computer assisted instruction) to train students for low-tech jobs a legitimate use of Federal funds? If operating high-tech equipment is included as a training option, requiring that the project be high-tech allows almost any training effort to be included.

Lesson 2: Applicants should be required to show the logic and plausibility of their project designs.

In general, demonstration projects are likely to be most successful if they propose a logical design of activities to be accomplished and objectives to be achieved. A logical project design identified the linkages between resources and activities, activities and short-term outcomes, and short-term outcomes and long-term outcomes. Applicants for Cooperative Demonstration grants often were unclear in their logic regarding how resources would be used to conduct the activities. For example, many projects indicated that Federal funds would be used to hire staff, but they often failed to report precisely what the staff would be doing. Future applicants should be required to explicitly show the logic of the project design.

A plausible project design has some likelihood of achieving its short-term objectives, where short-term is defined as the grant award period. Project objectives may be implausible because: 1) schedules are unrealistic; 2) resources are insufficient; or 3) available knowledge suggests that the project is not likely to achieve its objectives (e.g., objectives may be too ambitious or the staff may not posses the requisite skills). As with logic, applicants should be required to be explicit regarding the plausibility of the project design.

The panel reviewing the applications should include experts who are familiar with the high technology field or activities being proposed; and who can judge plausibility. Such experts could identify activities (e.g., the development of interactive videodiscs), which are not likely to be feasible within the time frame or resources proposed. The experts also could assess whether the applicant's experience in a field is sufficient to successfully accomplish more complicated activities, e.g., the construction of a Class I clean room for manufacturing computer chips.

For a project to have a good chance of succeeding, it should rank high on both logic and plausibility. Two high rankings suggest the project is likely to accomplish the activities and objectives stated in the application. By contrast, projects receiving a low ranking in either logic or plausibility begin with the disadvantage of little or poor planning. Furthermore, if logic and plausibility are important to the success of the project, OVAE should award points for them in the evaluation criteria. Applicants take their cue from the point award criteria in the grant application package to emphasize certain areas over others. No points were given for logic and plausibility, even though these have a serious impact on potential success.

Lessons Regarding Project Implementation.

Lesson 3: Grant awards should be made in the spring for project starts in the summer because of the greater availability of grantee staff, reduced training demands by other programs, and more opportunities for planning.

The timing of the award notification and starting date have important implications for project implementation. Most academic institutions plan their staffing and activities according to the academic-year calendar. Academic institutions plan in the spring for the following year and try to have both activity schedule and staff assignments settled by May or June preceding the September start.

Grants that start at the beginning of the academic year seem to be easier to implement than those starting mid-year. The difficulty with a mid-academic year start is that all available staff are already assigned to other projects, are in the midst of those assignments, and are reluctant to shift to a new assignment. If the grantee goes outside the institution to hire project staff, there may be fewer qualified staff available mid-year.

The major exception to scheduling project start-up for the beginning of the academic year is curriculum development projects that use significant amounts of instructor time to develop courses. In this type of project, the start of the curriculum development phase should coincide with the beginning of summer, when schools are out or teaching loads are light. In the summer, instructors have more time, are better able to concentrate, and will be able to integrate their new curriculum with their lesson plans for the fall semester.

Lesson 4: The applicant's proposed training should be appropriate to the labor needs of the geographic area surrounding the institution based on current labor market data.

The labor market data used by most applicants described potential job openings and economic conditions for the state or region, rather than for the county or city in which the institution was located. These labor market data often were one to three years old at the time of the application. Although the data may have demonstrated a need for job training, the jobs may have been located farther away than students were willing to commute (or relocate). The inability or unwillingness of students to take the jobs farther away negated the benefits of the training. Similarly, the jobs may have been available in the year(s) prior to the current recession or at the time a major employer was relocating to the area. These favorable conditions had changed by the time the students completed training (approximately 24 months after the application was submitted), and many students were unable to find employment in their area of training. Applicants should be required to justify the need for the grant based on recent data for the geographic area in which students are receiving training.

Lesson 5: Applicants should state in detail the role and responsibilities of the private partner(s) and include a statement from the partner agreeing to accept this role.

The specific role of the private sector was not well defined in the program regulations and the private sector role varied widely across projects. Among the FY1989 projects, the private sector functioned as a:

- Grantee;
- Referral source for students;
- Employer of program graduates;
- Source of internships;
- Member of the advisory group;
- Supplier of equipment; or
- Source of instructors.

Projects with multiple partners were considerably more likely to report that partners were customers, while projects with few partners used partners in more ways, including active sharing of instruction.

The regulations and application requirements provided little guidance regarding private-sector involvement. Because the regulations were vague about acceptable private-sector involvement, applicants similarly were vague in their descriptions of how private companies would be involved in their projects. The vagueness in the applications sometimes reflected incomplete planning on the part of the grantee. Other times it was the result of the grantee not being able to get the private partners to commit to training students or to activities other than advising the project.

The applicant should be required to submit a letter from each partner stating that it is willing to commit to the level and type of support stated in the application. After the award, and during the planning stage, the grantee should establish a formal agreement with the partner detailing precise responsibilities.

Lesson 6: Grantees should be encouraged to request changes to the scope of work in response to changes in the local labor market or other conditions.

Several projects encountered operational problems during various stages of the grant, including a deteriorating or shifting labor market, withdrawal of a key partner, or discovery that an activity was more complicated or expensive than originally estimated. In reviewing the implementation history of the projects, the study team thought some problems were severe enough to warrant a change in project design or objectives, although few such changes were requested. For example, grantees initially targeting hard-to-serve populations tended to shift their focus to less challenging students once they realized the difficulty of what they proposed. Other projects were unrealistic in their expectations of clients' initial academic skills or the number of workers needed by employers.

During the site visits, the teams asked project directors and staff why they did not request changes in grant scope to keep up with changing conditions. Almost all the project directors said that they thought they had to fulfill the terms of the application and that any requests for changes would be considered a sign of failure and/or not approved. This perception on the part of grantees resulted in projects continuing on an inappropriate--and sometimes unsuccessful--path.

Department program managers should discuss potential implementation problems with grantees at the start of the grant. The discussion should include both the nature of the problems encountered by other demonstrations (not just the Cooperative Demonstration Program) and the conditions under which it is important and acceptable to request changes to the scope of the grant. Second, program managers should use the monitoring telephone calls to discuss both the accomplishments of the project and the problems (potential or actual) preventing expected accomplishments. If project directors are open about the problems they encounter, then the program manager will be better able to suggest solutions or put the project director in touch with other grantees having similar problems. This more open communication, however, will require that program managers become more active in the internal operations of the project.

Lesson 7: The length of the grant should allow sufficient time for project start-up and accomplishment of the stated objectives.

The duration of the grant has implications both for the activities that can be carried out and the ability to draw conclusions based on grant outcomes. The time period for the Cooperative Demonstration grants was 18 months, with some projects requesting three- or six-month extensions. For grantees who began new projects or had no existing staff to assign to the project, between three and six months of the grant period was devoted to hiring staff, establishing office and contracting procedures, and planning training. For grantees with existing staff or a similar training activities already in place, startup time was not as great, and the training offered was often more extensive (e.g., part of an ongoing two-year training program). Almost all grantees agreed that 18 months was not enough time to complete training other than customized training.

A more workable arrangement would disaggregate the award into two separate but related grant periods totaling 24 months. The first period would be a six-month planning award during which the grantee could update the labor market information on which the training is justified, conduct curriculum development activities, and complete other startup activities. If labor market conditions or technology have changed, the training activities can be shifted accordingly. The planning award also would allow the grantee time to hire and orient the staff necessary to run the project. Finally, the planning grant allows time for the grantee to negotiate specific roles and responsibilities with the private partner. If the proposed private partner is unable to fulfill commitments made during the application process, the grantee has time to find an alternative partner(s).

The second award would fund actual training or other proposed activities for 18 months. Because grantees find it difficult to attract project staff if there is no certainty of long-term employment, the operating award would be denied only if their plans were not adequately developed. The operating plan would be submitted as the final report of the planning grant. The OVAE program managers (and perhaps the original review panel) would be required to review and approve the operating plan before the second award could be released.

Lesson 8: Grantees should limit the number of objectives and be held more accountable for meeting the objectives stated in their applications or revised scopes of work.

Applicants tended to state numerous objectives phrased in ways that made it difficult to measure success. Often the objectives referred to conditions that required more time than the grant period (e.g., produced journeyman technicians), required changes beyond the scope of the grant (e.g., make local employers more competitive), or were not time specific (e.g., meet employer's demand for trained workers).

Objectives should be stated in operational terms that can be measured by third-party evaluators, and the evaluations should focus on how well projects met those objectives. Although all projects had third-party evaluators, they were seldom used to measure the effectiveness of project activities or to determine the relative value of project components in the project's success. Instead, grantees used the outside evaluators to confirm that certain activities had taken place.

The evaluator would observe several classes, talk to several students and faculty, and produce a report of a few pages. In a few instances, evaluator was used to evaluate the curriculum materials used by the project rather than evaluate the project itself.

Lessons Regarding Project Costs

Lesson 9: Applicants should better substantiate the value assigned to in-kind contributions.

The non-Federal contribution by grantees was composed primarily of 1) grantee staff time and classroom space and 2) partner staff time and equipment donations. While the grantee staff time and space could be easily documented, the value assigned to partner staff and equipment contributions was simply self-declared without an independent appraisal. It is in the interest of the grantee to declare as high a value as possible for in-kind contributions so that they might more easily meet the minimum 25 percent contribution requirement as well as cast their application in a more favorable light by showing strong support from private industry. However, the possible inflated value of the donated equipment or partner staff time, also inflates the overall project cost data used in the cost benefit analysis of project outcomes. If the self-declared in-kind contribution is higher than the true fair market value, the costs per student trained, per staff member trained, per course developed, etc. would be incorrect and result in unreliable conclusions about the success of the demonstration.

In reporting the self-declared value of the donated equipment, grantees failed to include in their proposed budget, the cost of transportation, installation, maintenance, and supplies for the equipment. These additional, unplanned costs sometimes required the reallocation of grant funds after the project started or prevented the grantee from utilizing the equipment as proposed. Encouraging applicants to recognize all the costs associated with accepting donated equipment should help prevent a shortage of resources during implementation.

Lesson 10: Grantees should be encouraged to build upon the existing literature, curricula, and other educational resources available in the field.

Many of the projects engaged in curricula development either as a primary objective of the grant or in response to the requests for specific training from a partner organization. Rather than searching for existing course materials through ERIC or the OVAE curriculum centers and adapting these materials to the needs of the project, many projects developed their own curricula from scratch. Project directors reported they did not use--or at least review--the curriculum materials available elsewhere because 1) they considered their training to be "unique" and that materials developed elsewhere would not be relevant or 2) they were unaware that applicable materials were available elsewhere. A few project directors reported they checked with other grantees, but none reported conducting a systematic search of ERIC, the curriculum centers, or other clearinghouses.

To avoid wasting resources on the development of curricula that have already been developed elsewhere (unless that is the specific purpose of the demonstration), OVAE should require applicants to show evidence of a systematic search for their curricula prior to the start of any new development efforts. If the Department thinks such a systematic search is too burdensome during the application stage, it should be required as part of the initial six-month planning grant. Even if a search is conducted during application preparation, an updated search should be made during the planning grant stage to ensure that no new curriculum packages, published during the previous 12 months, are overlooked.

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Section I

INTRODUCTION

I. INTRODUCTION

This report summarizes the activities of and findings from an evaluation of projects funded by the Cooperative Demonstration Program (High Technology) in FY1988 and FY1989. The evaluation answers three questions: Did grant applications present a clear and coherent design for a project? Were grantees able to implement their projects as proposed, and, if not, what problems prevented implementation? Were project costs reasonable in relation to projected or actual outcomes?

Overview of the Cooperative Demonstration Program

The Cooperative Demonstration Program (PL 98-524, Title IV, Part B, Subpart 1) was the largest demonstration effort supported under the Carl D. Perkins Vocational Education Act of 1984 (see Appendix A for a copy of the legislation). The program provided the U.S. Department of Education (ED) and educational institutions an opportunity to try new approaches to vocational education and to learn about the effectiveness of these approaches. Funded projects reflected the act's priorities: increased access to high quality programs for special populations and overall improvement of the quality of vocational education. Projects also were to demonstrate successful cooperation among private employers and public agencies that resulted in training in advanced vocational education skills. The regulations suggested a variety of models, including: work experience and apprenticeship, worksite training, placement, and public works. Agencies eligible to apply included State Education Agencies (SEAs), Local Education Agencies (LEAs), postsecondary educational institutions, institutions of higher education, and other public and private agencies, organizations, and institutions.

Projects were authorized to be funded through grants, cooperative agreements, or contracts and could be:

1. Model projects providing improved access to quality vocational education programs for--

- Handicapped individuals;
- Disadvantaged individuals;
- Adults who are in need of training and retraining;
- Individuals who are single parents or homemakers;
- Individuals who participate in programs designed to eliminate sex bias and stereotyping in vocational education;
- Criminal offenders who are serving in a correctional institution; and
- Men and women seeking nontraditional occupations.

2. Projects that were examples of successful cooperation between the private sector (including employers, consortia of employers, labor organizations, and building trade councils) and public agencies in vocational education, including State boards and eligible recipients. The projects had to be designed to demonstrate ways in which vocational education and the private sector of the economy could work together effectively to assist vocational education students to attain the advanced level of skills needed to make the transition from school to productive employment, including

   - Work experience and apprenticeship projects; transitional worksite job training for vocational education students which is related to their occupational goals and closely linked to classroom and laboratory instruction provided by an eligible recipient;

   - Placement services in occupations which the students are preparing to enter; and

   - Where practical, projects that will benefit the public, such as the rehabilitation of public schools or housing in inner cities or economically depressed rural areas.

   The projects may include institutional and on-the-job training, support services authorized by the Act, and such other

> necessary assistance as the Secretary determines to be necessary for the successful completion of the project.
>
> 3. Projects to overcome national skill shortages, as designated by the Secretary in cooperation with the Secretary of Labor, Secretary of Defense, and Secretary of Commerce.
>
> 4. Such other activities which the Secretary could designate which are related to the purposes of the act. [Federal Register, 1985, pp. 33260-33261.]

All projects, however, had to directly serve people enrolled in vocational programs and be widely replicable by service providers. Furthermore, grant recipients had to provide, through cash or in-kind contributions, a minimum of 25 percent of the demonstration project's total cost. Contributions could include the fair market value of facilities, overhead, personnel, and equipment.

In addition to the authorized activities contained in the act, the Secretary of Education had the prerogative each year to establish priorities for the program. In the first year of the program (FY1988), an invitational priority (in addition to the absolute priority for authorized activities) was issued for projects addressing high technology. In FY1989, this invitational priority became another absolute priority. The term "high technology" was defined by the Perkins Act to mean:

> ...state-of-the-art computer, microelectronic, hydraulic, pneumatic, laser, nuclear, chemical, telecommunication, and other technologies being used to enhance productivity in manufacturing, communication, transportation, agriculture, mining, energy, commercial, and similar economic activity, and to improve the provision of health care. [34 CFR 400.4(b)]

The Application Process

Projects funded by the program were proposed and implemented by educational institutions, private agencies, and other organizations. Each year since the program's inception in FY1988, the Office of Vocational and Adult Education (OVAE), U.S. Department of Education, received grant applications from agencies, institutions, and organizations interested in conducting demonstrations. Program guidelines were published in the Federal Register. In FY1988, application materials were mailed directly to prospective applicants; in FY1989, OVAE staff instructed applicants to photocopy the application and instructions contained in the Federal Register.

In general, the application process was as follows. Applicants prepared and submitted project applications according to the published guidelines. Panels of outside readers, selected by OVAE, reviewed the applications and asked applicants for any necessary clarification. The applications were judged according to the following selection criteria and point allocations:

- Statement of need (15 points);
- Plan of operation (30 points);
- Quality of key personnel (10 points);
- Budget and cost effectiveness (10 points);
- Evaluation plan (5 points);
- Adequacy of resources (5 points);
- Private-sector involvement (10 points);
- Employment opportunities (5 points); and
- Dissemination (10 points).

The projects receiving the highest scores were awarded grants, and as many projects were funded as the program budget would allow. In FY1988, a total of $9.5 million was awarded, and in FY1989 grant awards totaled $9.2 million.

Of 181 applications submitted in the programs's first year (FY1988), 36 were approved and given grants ranging in size from $50,000 to $550,000. The winning projects were notified in October 1988 and most began their work around January 1989. Although operating in calendar years 1989 and 1990, the first cohort of projects are considered FY1988 projects because funding was appropriated from FY1988 Perkins Act funds.

In FY1989, 106 applications were submitted, and 30 received grants. Most of these projects began in January 1990, although at least two grantees who had received grants under the FY1988 competition delayed starting until July 1990 in order to complete their FY1988 projects.

Not all FY1988 projects had responded to the Secretary's invitational priority of addressing high-technology issues. OVAE identified only 23 of the 36 funded projects as being "high technology," based either on the type of job for which training was conducted (or curriculum developed) or on the nature of the training given students. These 23 projects were the focus of the first-year evaluation effort. All 30 projects funded in FY1989 addressed high-technology issues and were the focus of the second year evaluation effort. The lists of the FY1988 and FY1989 high technology projects are presented in Appendix B-1 and Appendix B-2.

Defining Project Boundaries

For this evaluation, "project" was defined as the activities funded by the Cooperative Demonstration grant and matching funds and occurring within the 18-month grant period. It did not include services provided before or after the grant period and benefits accruing after the end of the grant. Also excluded were the training activities and support services offered to project enrollees through other parts of the grantee institution. For example, a participant might enroll in training developed with project funds and provided by a project-supported instructor, using equipment donated by a local business as part of the non-Federal "match." Yet, to complete the degree or certificate for which the training was developed, the student might be expected (by the project design) to enroll in additional courses in the same institution that were not supported by the project. Students might also use financial aid or support services provided by or through the institution that were not part of the project. While these activities might be necessary to complete the degree or certificate, only those directly funded by the grant were included in this evaluation.

Boundaries of the project include interorganizational networks developed in the course of carrying out a project. Grantee institutions entered into a variety of formal and informal relationships with other organizations to offer students support services, provide them with jobs, or provide the project with additional financial or other assistance.

Overview of this Report

This final report is presented in six sections. Section I introduced the Cooperative Demonstration Program and the three major questions in the evaluation. Section II describes the modified evaluability assessment done for the 30 FY1989 projects and answers the first study question: were projects clearly and coherently designed? Section III describes the implementation of a subset of FY1989 projects, based on a mail survey of 30 projects (27 projects responded) and site visits to 19 projects. Section IV analyzes project costs relative to project accomplishments and answers the third study question: were project costs "reasonable?" Section V examines two groups of issues related to the management of the Federal program raised by the evaluation and suggests ways to improve future demonstration programs. Finally section VI summarizes the findings of the first four sections and recommends possible improvements in programs. The nine appendices describe the projects evaluated, the results of the mail survey, and the survey and field instruments.

Section II

AN ASSESSMENT OF PROJECT LOGIC AND DESIGN

II. AN ASSESSMENT OF PROJECT LOGIC AND DESIGN

This section ranks the clarity and coherence of 30 grant applications funded under the Cooperative Demonstration Program (High Technology) in FY1989. Each grantee application was assigned a score according to its internal logic and the plausibility of its design. Originally, this evaluation had intended to relate the applications' scores to the ultimate success of the projects. Of the 30 grant applications reviewed for logic and plausibility, four projects were predicted to be highly successful, 21 projects were predicted to be potentially successful, and five projects were predicted to be less successful. Ideally, only applications that offered well-defined sets of services and the possibility of success should be funded.

Predicting the likelihood for success of the proposed projects can be accomplished, in part, using a methodology known as an evaluability assessment (EA). While EAs are traditionally used to determine the most appropriate design for a program evaluation, parts of the methodology can be useful for determining the logic or clarity and the plausibility or coherence of individual project designs. Part A describes the procedures used to develop a logic model for each funded project and to characterize the logic of the proposed design. Part B describes the procedures used to score the plausibility of each project design. Part C ranks the projects on both logic and plausibility to arrive at an overall prediction of success for the project.

A. Assessing the Logic of the Project Design

The first part of the assessment created a logic model for each proposed project. Logical designs include well-defined project objectives and activities that are linked to those objectives. Projects are more likely to succeed if they propose a clear and logical design of objectives to be achieved and activities to be accomplished. Designs can be detailed but illogical if activities do not proceed systematically from objectives. Unclear designs, however, cannot be logical because there is insufficient information to trace the logic linking the components. Projects may be uneven, with some clear and logical components and others that are not.

To determine each application's logic, the study team reviewed each grant application to identify the following:

- An explicitly stated set of inputs or resources;
- An explicitly stated set of activities or events;
- An explicitly stated set of outcomes (short-term and long-term); and
- An explicitly stated set of causal links among events and outcomes that establish the flow of effects expected from the project.

The study team recorded the components of each of the 30 grant applications in a logic shell illustrating the linkages. Two contrasting examples of logic models illustrating the procedure are provided. Figure II-1 displays a logic model where several events are linked with project outcomes, demonstrating a clear and logical design. In contrast, Figure II-2 displays a project design where no such linkages are evident. Scoring each design reflects whether the project posses a logical design according to procedures described below.

Figure II-1

ILLUSTRATIVE LOGIC MODEL WITH NUMEROUS LINKAGES (HOME BUILDERS INSTITUTE)

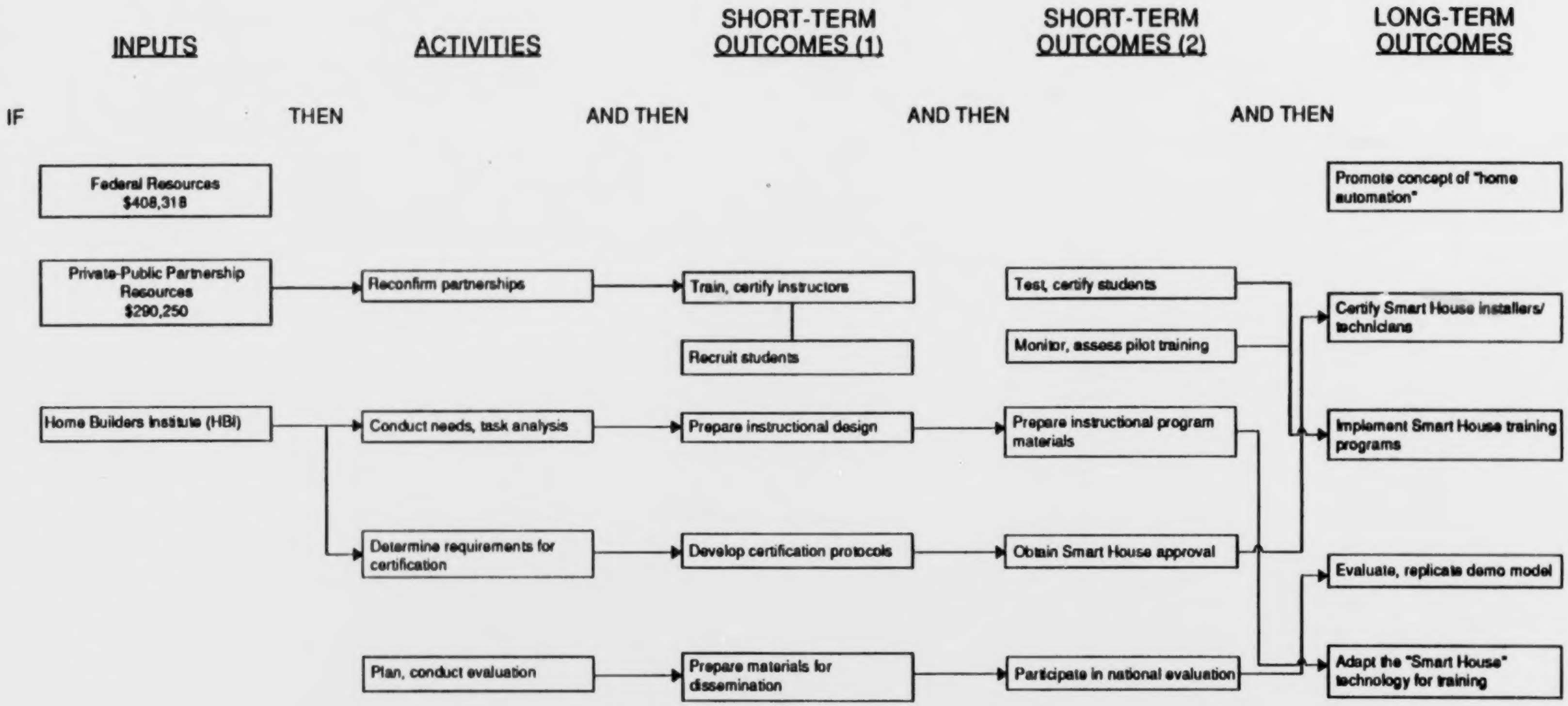
INPUTS
ACTIVITIES
SHORT-TERM OUTCOMES (1)
SHORT-TERM OUTCOMES (2)
LONG-TERM OUTCOMES
IF
THEN
AND THEN
AND THEN
AND THEN
Federal Resources $408,318
Private-Public Partnership Resources $290,250
Home Builders Institute (HBI)
Reconfirm partnerships
Conduct needs, task analysis
Determine requirements for certification
Plan, conduct evaluation
Train, certify instructors
Recruit students
Prepare instructional design
Develop certification protocols
Prepare materials for dissemination
Test, certify students
Monitor, assess pilot training
Prepare instructional program materials
Obtain Smart House approval
Participate in national evaluation
Promote concept of "home automation"
Certify Smart House installers/technicians
Implement Smart House training programs
Evaluate, replicate demo model
Adapt the "Smart House" technology for training

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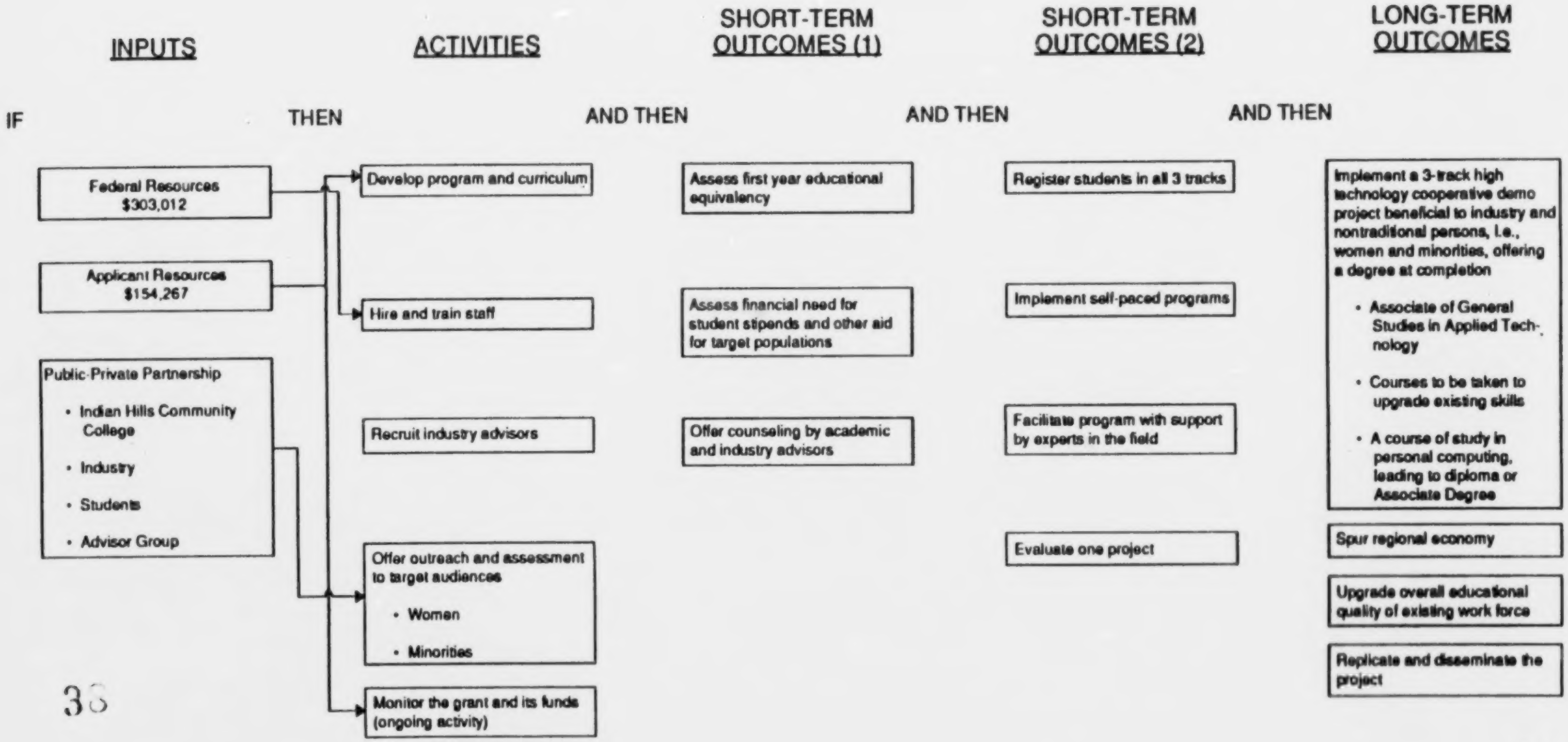
Figure II-2

ILLUSTRATIVE LOGIC MODEL WITH FEW LINKAGES (INDIAN HILLS COMMUNITY COLLEGE)



INPUTS

IF

- Federal Resources $303,012
- Applicant Resources $154,267
- Public-Private Partnership
  - Indian Hills Community College
  - Industry
  - Students
  - Advisor Group

ACTIVITIES

THEN

- Develop program and curriculum
- Hire and train staff
- Recruit industry advisors
- Offer outreach and assessment to target audiences
  - Women
  - Minorities
- Monitor the grant and its funds (ongoing activity)

SHORT-TERM OUTCOMES (1)

AND THEN

- Assess first year educational equivalency
- Assess financial need for student stipends and other aid for target populations
- Offer counseling by academic and industry advisors

SHORT-TERM OUTCOMES (2)

AND THEN

- Register students in all 3 tracks
- Implement self-paced programs
- Facilitate program with support by experts in the field
- Evaluate one project

LONG-TERM OUTCOMES

AND THEN

- Implement a 3-track high technology cooperative demo project beneficial to industry and nontraditional persons, i.e., women and minorities, offering a degree at completion
  - Associate of General Studies in Applied Technology
  - Courses to be taken to upgrade existing skills
  - A course of study in personal computing, leading to diploma or Associate Degree
- Spur regional economy
- Upgrade overall educational quality of existing work force
- Replicate and disseminate the project

Developing the Logic Model

The study team followed a six-step process when reviewing grant applications provided by the OVAE program office. The team assembled all material pertaining to the grant application and proposal, including: the original proposal; any revisions to the original proposal; correspondence dated prior to the award date of the grant; supplementary material submitted by the applicant prior to the date of award; and grant award documents.

Next, the team identified long-term outcomes from information contained in each application's introduction, statement of need, and objectives. Long-term outcomes were entered in the logic model shell. The team recorded all information as stated in the application and, when information was available, specified who the project was intended to serve. The team next entered short-term objectives from information in the "plan of operation" section of the application. Then the team entered the resources available to the project on the first day of the grant award from the budget, introduction, and other parts of the application.

Finally, the team showed the stated causal links between inputs, activities, short-term goals, and long-term goals with directional arrows, based on reviewing budget narrative for explanations of how Federal and non-Federal funds were to be spent. A directional arrow was drawn when the narrative matched activities specified in the diagram. The team reviewed the remainder of the application for other logical relationships stated explicitly within the same paragraph in the proposal. Because paragraphs should represent complete thoughts, linkages were designated only if two elements were expressed within the same paragraph. This is a restrictive approach and affects the projects' final rankings. Without such restrictions, however, the team could not determine objectively if or how the applicants intended to connect the activities. Boxes without connecting arrows represent logical gaps.

Scoring Project Logic

Procedure. Applications were scored in a three-step process. First, the study team counted the number of inputs, activities, short-term outcomes, and long-term outcomes. Totals for each are shown in the summary of "Raw Scores of Project Logic," presented in Appendix C-1.

Then the team determined what activities were identified for achieving each short-term outcome. The team assigned one point for each short-term outcome supported by at least one activity and subtracted one point for each short-term outcome not so supported.

Next, the team determined the short-term outcomes identified for achieving each long-term outcome. Again, the team assigned one point for each long-term outcome supported by at least one short-term outcome and subtracted one point for each long-term outcome not so supported.

Analysis. The design of the project was considered clear and logical if it met five conditions. First, the design must have identified at least one long-term outcome, e.g., access to quality vocational education training or enhancement of the competitive strength of local industry. Second, the design had to identify one or more short-term outcomes to be achieved during the grant period that would help achieve long-term outcomes. Third, the design had to specify one or more activities during the grant period that would help achieve a short-term or long-term outcome. Fourth, the design had to have had more linkages than gaps between activities and short-term outcomes. Total points assigned to linkages or gaps, therefore, must yield a positive number to be considered logical, e.g., a project that had four explicit linkages and two gaps had a total score on this criterion of +2. Fifth, the design had to have more linkages than gaps between short-term outcomes and long-term outcomes. The total points assigned to linkages or gaps had to be a positive number, e.g., a project that had four stated linkages and three gaps had a total score on this criterion of +1. Raw scores for the projects are shown in Appendix C-1.

Results of the Logic Assessment

Description of Project Logic. Using these procedures, the study team assigned each project an overall score for logic. After testing for the presence of all five conditions, it found:

- All 30 projects identified one or more long-term objectives;
- Eleven projects linked one or more short-term outcomes to a long-term outcome;
- Twenty-nine projects linked one or more activities to a short-term outcome;
- Twenty-three projects displayed more linkages than gaps between activities and short-term outcomes; and
- Only two projects displayed more linkages than gaps between short-term and long-term outcomes.

Table II-1 ranks each project according to the five conditions and shows total scores. Based on the overall scores, nine projects received a high rating; 16 received a medium rating; and five received a low rating. Table II-2 summarizes the logic rankings of all the projects.

Most applications met two criteria: they identified long-term outcomes and linked proposed activities to short-term outcomes. To demonstrate a logical design, however, the proposals also needed to identify linkages between short-term and long-term outcomes. Only two projects had more linkages than gaps between short-term and long-term outcomes. Further, application's often were unclear about how resources would be used to conduct the activities. Many projects indicated that Federal funds would be used to hire staff. They often failed, however, to report precisely what staff would be doing. In summary, most applications did not explicitly link resources with activities.

Table II-1

RESULTS OF PROJECT LOGIC

Project	Conditions for Project Logic					Total
	One Design must identify one or more long-term outcomes	Two Design identifies one or more short-term outcomes that are linked to long-term outcomes	Three Design specifies one or more activities linked to short- or long-term outcomes	Four Design must have more linkages than gaps between activities and short-term outcomes	Five Design must have more linkages than gaps between short- and long-term outcomes	
Alabama Aviation College	+	–	+	–	–	+2
Ben Hill Institute	+	–	+	+	–	+3
Bronx Community College	+	–	+	+	–	+3
Chattanooga State College	+	+	+	–	–	+3
Clackamus Community College	+	+	+	+	–	+4
Columbia Basin College	+	+	+	+	–	+4
El Paso Community College	+	–	+	+	–	+3
Fox Valley Tech	+	–	+	+	–	+3
Fresno City College	+	–	+	+	–	+3
Hampden County Consortium	+	–	+	+	–	+3
Home Builders Institute	+	+	+	+	+	+5
Howard Community College	+	–	+	–	–	+2
Illinois Central College	+	+	+	+	–	+4
Illinois Eastern College	+	–	+	+	–	+3
Indian Hills College	+	–	–	–	–	+1
John M. Patterson College	+	–	+	+	–	+3

(Continued on next page)

Table II-1, (Continued)

	Conditions for Project Logic					
Project	One Design must identify one or more long-term outcomes	Two Design identifies one or more short-term outcomes that are linked to long-term outcomes	Three Design specifies one or more activities linked to short- or long-term outcomes	Four Design must have more linkages than gaps between activities and short-term outcomes	Five Design must have more linkages than gaps between short- and long-term outcomes	Total
LTV Steel Co.	+	–	+	–	–	+2
Luzerne Community College	+	+	+	+	–	+4
Nebraska Labor Department	+	–	+	+	–	+3
Northampton Community College	+	–	+	+	–	+3
North Clackamus Schools	+	–	+	+	–	+3
Partners (PAVE)	+	–	+	+	–	+3
Research and Development Center	+	+	+	+	+	+5
Southwestern College District	+	–	+	+	–	+3
Valencia Community College (CIM)	+	+	+	+	–	+4
Valencia Community College (Health)	+	+	+	+	–	+4
Valencia Community College (Tele)	+	+	+	–	–	+3
Waubonsee Community College	+	–	+	–	–	+2
West Virginia Department of Education	+	–	+	+	–	+3
West Virginia Northern College	+	+	+	+	–	+4

Table II-2

SUMMARY OF PROJECT LOGIC

High in Project Logic		Medium	Low in Project Logic	
Meets all Five Conditions	Meets Four Conditions	Meets Three Conditions	Meets Two Conditions	Meets One Condition
Research and Development Center Home Builders Institute	Luzerne Community College Valencia Community College (Health) Valencia Community College (CIM) Clackamus Community College Illinois Central College Columbia Basin College West Virginia Northern College	Hampden County Consortium Fresno City College Valencia Community College (Tele) Nebraska Labor Department Chattanooga State College Ben Hill Institute Northampton Community College North Clackamus Schools Illinois Eastern College Fox Valley Tech Bronx Community College Partners (PAVE) El Paso Community College Southwestern College District West Virginia Department of Education John M. Patterson College	Waubonsee Community College Howard Community College LTV Steel Co. Alabama Aviation College	Indian Hills College

B. Assessing the Plausibility of Project Design

Defining Plausibility

A plausible project is one with some likelihood of achieving its short-term objectives (short-term is defined as the 18 months of the grant award period). Project objectives may be implausible because schedules are unrealistic, resources are insufficient, or available knowledge suggests that the projects are unlikely to achieve objectives (e.g., too ambitious, or unskilled staff). Thus, assessing the plausibility of the project's design means determining the degree to which a project:

- Is well defined;
- Describes feasible relationships among components;
- Can be completed with available resources; and
- Can be completed within the specified time period.

For each major short-term outcome, the study team asked the following questions: Are resources adequate to achieve outcomes? Is the schedule for achieving the outcome reasonable? Do the activities suggest an understanding of the steps necessary to achieve the outcome? The answers to these questions were recorded in Table II-3.

Procedures for Assessing Plausibility

The team followed a five-step process to determine project plausibility. First, it reviewed the logic models already developed as well as the grant application to determine whether resources were adequate for each activity. One point was assigned to each activity supported by at least one resource, and one point was subtracted for each activity not so supported. Point totals are shown in the summary of "Raw Scores of Project Plausibility," in Appendix C-2.

Second, the study team assessed whether all proposed activities could be completed within the 18-month grant period. Activities judged doable were awarded one point; one point was subtracted for each activity that could not be completed in 18 months.

Third, the study team determined whether all the proposed short-term outcomes could be achieved within the 18-month grant period. One point was assigned to those that could be achieved within the grant period; one point was subtracted for each that could not be achieved.

Fourth, the study team determined whether the overall project design and outcomes (long-term and short-term) adequately reflected the two objectives required for the Cooperative Demonstration Program:

1. Access to quality vocational education training; and
2. Successful cooperation between public and private sectors.

One point was assigned if the project design and/or long-term or short-term outcomes adequately reflected the required objectives for the Cooperative Demonstration Program.

The design of the project was considered highly plausible if it met all four conditions. Projects that met three conditions were considered "plausible." Projects that met fewer than three criteria were considered "less plausible".

Results of the Plausibility Assessment

Description of the Plausibility Assessment. Thirty FY1989 projects were scored for project plausibility, and the results are shown in Table II-3. It was found that:

- Twenty-three of the 30 projects appeared to allocate sufficient resources to conduct their activities;

Table II-3

RESULTS OF PROJECT PLAUSIBILITY

Project	Sufficient Resources	Sufficient Time for Activities	Sufficient Time for Short-Term Outcomes	Access to Training Public/Private Partnership	Total
Alabama Aviation College	+	+	+	+	+4
Ben Hill Institute	+	+	+	–	+3
Bronx Community College	+	+	+	+	+4
Chattanooga State College	+	+	+	–	+3
Clackamus Community College	+	+	+	+	+4
Columbia Basin College	+	+	+	–	+3
El Paso Community College	–	+	+	+	+3
Fox Valley Tech	+	+	+	–	+3
Fresno City College	–	+	+	+	+3
Hampden County Consortium	+	+	+	+	+4
Home Builders Institute	+	+	+	–	+3
Howard Community College	–	+	+	+	+3
Illinois Central College	+	+	+	+	+4
Illinois Eastern College	+	+	+	–	+3
Indian Hills College	+	+	+	+	+4
John M. Patterson College	–	+	+	+	+3

(Continued on next page)

Table II-3, (Continued)

Project	Sufficient Resources	Sufficient Time for Activities	Sufficient Time for Short-Term Outcomes	Access to Training Public/Private Partnership	Total
LTV Steel Co.	–	+	+	+	+3
Luzerne Community College	+	+	+	+	+4
Nebraska Labor Department	+	+	+	+	+4
Northampton Community College	+	–	+	+	+3
North Clackamus Schools	+	+	+	–	+3
Partners (PAVE)	+	+	+	+	+4
Research and Development Center	+	+	+	+	+4
Southwestern College District	+	+	+	+	+4
Valencia Community College (CIM)	–	+	+	+	+3
Valencia Community College (Health)	+	+	+	–	+3
Valencia Community College (Tele)	+	+	+	+	+4
Waubonsee Community College	–	+	+	+	+3
West Virginia Department of Education	+	+	+	+	+4
West Virginia Northern College	+	+	+	–	+3

- Twenty-nine projects appeared capable of completing the proposed activities within 18-months;
- All thirty projects appeared capable of achieving the proposed short-term outcomes in the 18-month time frame; and
- Twenty-one projects reflected the two objectives of the Cooperative Demonstration Program: access to training and a successful public/private partnership.

Analysis of the Plausibility Assessment. Thirteen projects were scored as highly plausible, and 17 projects were scored as plausible (see Table II-4). For an example, the application submitted by Alabama Aviation College met all four conditions. This project developed a training model and curriculum in aviation maintenance targeted toward minorities and females (underrepresented groups). Outcomes specifically reflected the objectives of the program, i.e., access for underrepresented groups and a successful public/private partnership.

Table II-4

SUMMARY OF PROJECT PLAUSIBILITY

Highly Plausible	Plausible	Less Plausible	
Meets all four conditions	Meets three conditions	Meets two conditions	Meets one condition
Luzerne Community College	John M. Patterson College		
Research and Development Center	Howard Community College		
Nebraska Labor Department	Chattanooga State College		
Illinois Central College	Valencia Community College (CIM)		
Valencia Community College (Tele)	Home Builders Institute		
Clackamus Community College	Northampton Community College		
Hampden County Consortium	North Clackamus Schools		
Indian Hills College	West Virginia Northern College		
Alabama Aviation College	Illinois Eastern College		
Bronx Community College	LTV Steel Co.		
Partners (PAVE)	Columbia Basin College		
Southwestern College District	Ben Hill Institute		
West Virginia Department of Education	Waubonsee Community College		
	Valencia Community College (Health)		
	Fresno City College		
	Fox Valley Tech		
	El Paso Community College		

C. Summary of the Evaluability Assessment

Thirty FY1989 projects were assessed on the logic and plausibility of their project design as stated in their grant applications. On logic, nine were rated high, 16 medium, and five low. On plausibility, 13 were highly plausible, and 17 were plausible--no projects were "less plausible."

A project with a good chance of succeeding should rank high on both logic and plausibility. By contrast, projects receiving a low rating in either logic or plausibility began with the disadvantage of little or poor planning. Table II-5 shows the logic and plausibility rankings of all 30 projects. Accounting for both logic and plausibility, four projects were predicted to be highly successful, 21 projects were moderately successful, and five projects less successful. Table II-6 summarizes the predictions for project success.

Comparing FY1988 and FY1989 Projects

Table II-7 compares final rankings in project logic for FY1988 and FY1989 applications--showing similar distribution of applications across categories. FY1988 and FY1989 applications differed on scores for project plausibility (Table II-8). More FY1989 than FY1988 applications scored high in project plausibility. No FY1989 projects scored low in project plausibility, while seven of the FY1988 projects received low plausibility scores.

In rankings of logic and plausibility used to predict project success, FY1988 and FY1989 projects showed similar rates for high success (Table II-9). However, FY1989 projects were predicted to be potentially successful at twice the rate of FY1988 projects. This was due, in part, to the fact that reviewers did not require FY1989 projects to mention explicitly a successful public/private partnership as one of its outcomes. If projects reflected the public/private partnership in its overall design and/or outcomes, grantees were awarded one point.

Table II-5

SUMMARY OF PROJECT LOGIC AND PLAUSIBILITY

Project	Project Logic	Project Plausibility
Alabama Aviation College	Low	High
Ben Hill Institute	Medium	Medium
Bronx Community College	Medium	High
Chattanooga State College	Medium	Medium
Clackamus Community College	High	High
Columbia Basin College	High	Medium
El Paso Community College	Medium	Medium
Fox Valley Tech	Medium	Medium
Fresno City College	Medium	Medium
Hampden County Consortium	Medium	High
Home Builders Institute	High	Medium
Howard Community College	Low	Medium
Illinois Central College	High	High
Illinois Eastern College	Medium	Medium
Indian Hills College	Low	High
John M. Patterson College	Medium	Medium
LTV Steel Co.	Low	Medium
Luzerne Community College	High	High
Nebraska Labor Department	Medium	High
Northampton Community College	Medium	Medium
North Clackamus Schools	Medium	Medium

(Continued on next page)

Table II-5, (Continued)

Project	Project Logic	Project Plausibility
Partners (PAVE)	Medium	High
Research and Development Center	High	High
Southwestern College District	Medium	High
Valencia Community College (CIM)	High	Medium
Valencia Community College (Health)	High	Medium
Valencia Community College (Tele)	Medium	High
Waubonsee Community College	Low	Medium
West Virginia Department of Education	Medium	High
West Virginia Northern College	High	Medium

Table II-6

PREDICTION FOR PROJECT SUCCESS

		Project Plausibility		
Project Logic		High	Medium	Low
High	(9)	4	5	0
Medium	(16)	6	10	0
Low	(5)	2	3	0

▦ = predicted to be highly successful
░ = predicted to be potentially successful
☐ = predicted to be less successful

Table II-7

ANALYSIS OF PROJECT LOGIC: FY1988 AND FY1989

	High	Medium	Low	Total
FY1988	8	10	5	23
FY1989	9	16	5	30

Table II-8

ANALYSIS OF PROJECT PLAUSIBILITY: FY1988 AND FY1989

	High	Medium	Low	Total
FY1988	4	12	7	23
FY1989	13	17	0	30

Table II-9

RANKING FOR LOGIC AND PLAUSIBILITY: FY1988 AND FY1989

	Successful	Potentially Successful	Less Successful	Total
FY1988	3	10	10	23
FY1989	4	21	5	30

As shown in Table II-10, FY1988 and FY1989 projects were deemed logical at about the same rates, with the exception of condition five (linkages than gaps between short-term and long-term outcomes). Fewer FY1989 than FY1988 projects showed more linkages than gaps between short-term and long-term outcomes.

In conclusion, the rate at which projects were predicted to be successful doubled from FY1988 to FY1989. This increase was linked, in part, to relaxing the condition that projects demonstrate public/private partnerships in scoring plausibility. Projects from both years were rated about the same with respect to logic, while FY1989 projects tended to score higher in plausibility.

Recommendations to Strengthen Applications

To strengthen grant applications--as well as the review process--the Office of Vocational and Adult Education could require a project flow diagram (see Figure II-3) as part of each applicant's "Plan of Operation." The following instructions could be given applicants:

> Instructions for Writing the Plan of Operation: State the major objectives of your project. These should be entered under "Final Outcomes" in the fifth column on the flow diagram. Next, list the resources in the first column (including Federal and non-Federal) used to support the project. State dollar amounts.
>
> Under the activities column, list activities to be undertaken at the beginning of the project. Start each item with an action verb, e.g., "convene the advisory panel," "hire instructors," "assemble equipment." Then draw a line linking each resource with the appropriate activity. This shows which resources are allocated to each activity.

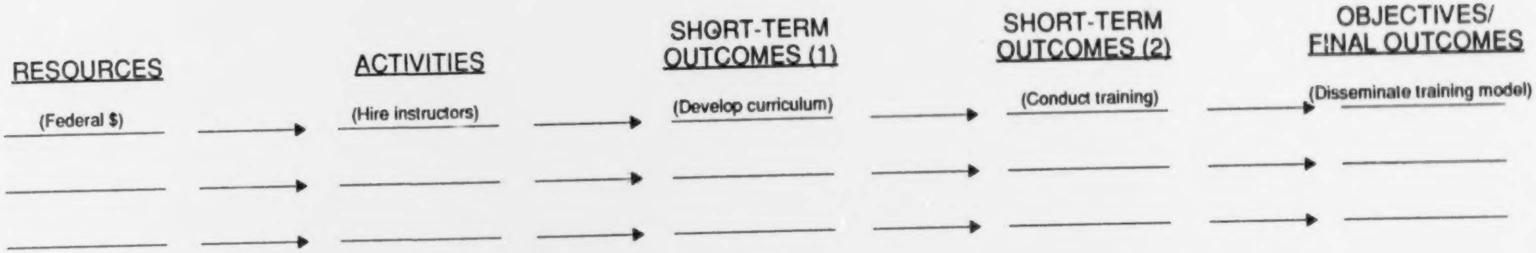
Table II-10

SCORING PROJECT LOGIC: FY1988 AND FY1989

Conditions	FY1988	FY1989
One or more long-term outcomes	23	30
One or more short-term outcomes linked with long-term outcomes	10	11
One or more activities linked with short-term outcomes	21	29
More linkages than gaps between activities and short-term outcomes	16	23
More linkages than gaps between short-term and long-term outcomes	5	2

Figure II-3

FLOW DIAGRAM WITH PLAN OF OPERATION


RESOURCES
(Federal $)
ACTIVITIES
(Hire instructors)
SHORT-TERM OUTCOMES (1)
(Develop curriculum)
SHORT-TERM OUTCOMES (2)
(Conduct training)
OBJECTIVES/ FINAL OUTCOMES
(Disseminate training model)

> In the third column, list short-term outcomes resulting from each activity; e.g., an outcome from "convene advisory panel" might be "draft recommendations of skills to be taught." Second short-term outcome might be "incorporate skills into training module."
>
> Draw a line between each activity resulting a short-term outcome. Link each short-term outcome. Example:

Resource	Activity	Short-term outcome
Federal -------------> $300,000	hire -----------> instructors	develop curriculum

> The diagram is complete if all short-term objectives lead to one of the long-term outcomes listed in column five. Draw a line linking short-term outcomes leading to separate long-term outcomes. If any short-term outcome does not directly relate to one of the long-term outcomes, it may not belong in the project. Base the "Plan of Operation" in the narrative section of the application using the flow diagram. Don't forget to include the flow diagram with the Plan of Operation.

Other Federal grant programs, e.g., demonstration grants for preventing alcohol and other drug abuse, have required applicants to include logic models as a formal part of the application. The instructions given to their applicants are as follows:

> A logic model should underlie the conceptual development and preparation of the proposal. The logic model is a conceptual framework that links (1) basic assumptions about risk/protective factors, (2) mechanisms of intervention and (3) outcomes. In this model, the application:
>
> - specifies the risk factors and/or resiliency/protective factors at the individual, parent and family, peer group, school or neighborhood levels being addressed in the proposal; articulates the assumptions being made, that is, relates these risk or

resiliency/protective factors to the use and abuse of alcohol and other drugs by youth; literature documentation;

- relates the proposed strategies or interventions to specific risk/protective factors, that is, explains why these interventions should help reduce these risk factors or enhance these resiliency factors; and

- Identifies the measurable/observable outcomes that can logically be anticipated from the interventions.

OVAE may wish to include a similar requirement in future demonstration regulations.

Section III

PROJECT IMPLEMENTATION

III. PROJECT IMPLEMENTATION

A. Framework for Studying Implementation

The analysis of project implementation was based on a plan developed early in the study but later revised. In the original plan, the study team concentrated on the following set of questions:

Project Administration:

- Did the project establish the administrative infrastructure necessary for its activities, i.e., did the project hire staff, obtain space, schedule services, engage an evaluator, etc.? To what extent was the project infrastructure already in existence when the grant began?
- What kinds of partnerships were established and what problems arose in creating them? Was public-private cooperation established, and what other partnerships arose (with support service providers, service delivery areas, etc.)?
- What did projects do to prepare for training or other direct services, e.g., skill identification, curriculum development, licensure, coordination with other providers, or staff training?
- What was done to recruit students? In particular, what type of students did projects seek to attract, and how did the projects go about doing it? Were there particular efforts to attract special populations, and, if so, which populations?
- What was done to continue the project beyond the 18 months of the Federal grant? If the project was continued, were the activities successful?

Project Content and Intermediate Outcomes:

- What kinds and amounts of training or other direct services were provided to students through the grants? How many were trained? How many got jobs?

- How did projects identify needed job skills and how was the information used? Project proposals suggested substantial amounts of time for skill identification--hence the evaluation sought to determine the use of the skill information.

- What curricula were developed and how were they used? As with skill identification, curriculum development was emphasized in grant applications.

- What linkages were developed with other public sector agencies or community-based organizations? With what effects? To what extent did other agencies aid in recruitment, training, placement, etc.?

Extent and Kinds of Innovation:

- To what extent did the grants provide opportunities for new directions and experimentation?

After analyzing the FY1988 grantees and incorporating the suggestions of the advisory panel and Federal officials, the study team revised the evaluation plan. Although efforts to characterize the projects along the first two dimensions outlined above were retained, the implementation analysis was expanded to focus on five issues:

- Nature of the training;

- Type and intensity of public-private cooperation;

- Meaning of "high technology" within the projects;

- Extent to which the projects were operationally successful; and

- "Exportability" to others of what was developed or learned at each site.

The final item, exportability, substituted for the examination of innovation that was originally planned. The Federal office administering the program argued that it was not a condition of this demonstration program that projects be new, innovative, or experimental. Hence, assessing projects on the extent of their innovativeness would be unfair. Each of the five issues is briefly discussed below.

The Nature of Training. The evaluation of FY1988 grantees showed that the types and amounts of training delivered under the program differed considerably among the projects. The range of training activities was impressive--from half-day workshops for business managers on the virtues of a particular piece of equipment to two-year technical degree programs for nontraditional students. The range also meant, however, that it was hard to discern the precise nature of the federal demonstration, to understand if there were sufficient commonalities among the projects to describe them jointly, and to conduct the cost-benefit analysis which was a mandated part of the evaluation.

There was also a specific question raised in the Year One report about the efficacy of customized training as a part of the demonstration effort. Three of the eight Year One high-tech grantees visited by the evaluation team were customized training projects. The grantees--usually community colleges--provided highly specific training to the employees of individual companies. Often the training was designed to enable the employees to use a piece of specialized equipment or software, although it might also be aimed at teaching more generic occupational or basic skills. The regulations of the Cooperative Demonstration Program note that all projects assisted under the program must be capable of wide replication by service providers--an outcome that seems questionable for many customized training projects. Questions were raised in the Year One report about both the overall desirability of narrow training under Federal sponsorship, as well as about the specific priorities that could be introduced to ensure that some broader public interest was served.

The advisory panel also raised questions about the advisability of supporting demonstration projects that provided students with short-term training aimed at specific, entry-level jobs (regardless of whether it was customized for a particular employer). This form of training was offered by many of the Year One grantees visited. The panelists argued that demonstrations should be concerned with how to increase trainee skills and employment options, not just with the demands of specific entry-level jobs. There was considerable interest in whether projects supported through the program were engaged in public-private cooperative ventures to deliver both job-specific and more general skill training and what could be learned from such ventures.

The Type and Intensity of Public-Private Cooperation. Based on Year One findings, the evaluation team identified a variety of public-private relationships:

- The private sector partner was a customer of the project--the project provides training for employees of the company;
- The partner was a member of an advisory committee or an informal board;
- The partner was a supplier of resources such as equipment, and/or jobs at project completion;
- The partner was an active participant in delivery of instruction or other services; or
- The partner initiated the project and approached the grantee for assistance.

Among Year One grantees, most of the projects visited had relationships with private sector partners in which the partner played a customer or advisor role, sometimes also contributing equipment for training. A few projects did not have private sector businesses as partners. In only one of the eight grantees visited did the evaluation team see a project in which a private sector business had participated actively in both the design of the project and in service delivery. As with the search for interesting training models, then, the desire in Year Two was to identify partnerships that might be breaking new ground, i.e., that might provide models of public-private cooperation for high-tech training.

Defining High Technology. Based on Year One findings, the meaning of high technology, like the meaning of public-private cooperation, varied considerably. As discussed in Section I, the definition included in the law and regulations was quite broad. Based on Year One findings, the study team characterized the actual high-tech elements of the projects the study team visited first in terms of the field for which students were preparing. If the field was not high-tech, the study team then focused on the specific training received. Four definitions of high technology emerged:

- Training was designed to prepare students for jobs in fields generally considered high-tech because they manufactured (or serviced) high technology products. The training itself may have been sophisticated or basic, and have led to upgrading skills of current workers or to entry-level jobs.
- Training enabled students to use high-tech equipment even though the field in which they worked (or sought work) was not considered high tech. For example, one project taught computer assisted design (CAD) or the use of sophisticated diagnostic equipment to repair automobiles.
- Training taught students to use computers, irrespective of the field for which training occurred. For example, some projects prepared students to be secretaries by teaching word processing skills.
- Training was provided in basic skills as preparation for later occupational training in a high-tech field. The grant supported the basic skill phase of instruction with the understanding that the students who improved

> their basic skills would enter training that met one of the three definitions above.

In short, not all projects shared a common understanding of what was meant by high-tech training. To identify the range of projects, especially those that were training students in ways that appeared to be "state of the art," the second year of the evaluation focused on understanding the high-tech elements of the projects studied.

Operation and Integration of the Demonstration within the Institution. In Year One there were a number of projects that experienced delays in start-up and appeared to be in danger of terminating with the end of the Federal grant. The study team identified timing issues that appeared to affect start-up, but reasoned that projects with stronger ties to the institutions in which they were located might have a better chance to start promptly and continue after the end of the grant period. They might also be better able to draw upon the expertise of regular teaching staff and use facilities effectively in program development and delivery. This section looks at this and other problems that arose in implementing project designs.

Exportability of Project Design, Activities, and Products. The Cooperative Demonstration Program was intended to demonstrate models of public-private cooperation in the delivery of training. As stated in the regulation, all projects were to be "(1) Of direct service to the individuals enrolled; and (2) Capable of wide replication by service providers" (CFR 34, Ch. IV (7-1-88 Edition), Part 412, Subpart B). The program was to produce

> model projects providing improved access to quality vocational education for [special populations] and ...examples of successful cooperative between the private sector...and public agencies in vocational education...

The way in which the study team chose to characterize the demonstration element of the Cooperative Demonstration Program was exportability, i.e., that which can be taken from the projects that have been supported and applied elsewhere. In other terms, what can a service provider interested in effective partnership use or apply from what has been produced as a result of the Cooperative Demonstration Program?

Some projects were clearly demonstrations by design. These were projects aimed at development of a specific product, usually a curriculum, that can be applied by others. They used the grant to develop the curriculum and conduct a formative evaluation (pilot test) or they used the grant to test the replicability of the curriculum in additional institutions or with new populations. These projects were usually characterized by formal evaluation designs that accompanied project (curriculum) development and implementation. In Year One, only a very few of the projects were of this type.

More commonly, projects were aimed at adding dimensions to, or improving the delivery of, training at the grantee institution. While that was certainly a worthwhile goal from the institution's perspective, it does not necessarily translate into a demonstration unless the process of institutional "capacity building" yields two things. First, it must provide evidence of effectiveness--i.e., that the procedures undertaken did, in fact, build the institution's offerings or improve the delivery of instruction in measurable ways. Second, it must yield a guide or other device that shows others how they can accomplish the same changes using the same procedures--i.e., it must be made capable of replication. The study team sought to determine which, among the FY1989 projects, held promise as models capable of replication.

The implementation analysis in this section is organized around these five issues. If the reader would like additional information on project administration, content, and intermediate outcomes, please refer to the report on the overall findings of the implementation survey in Appendix F. Additional information, including more detailed grantee-by grantee-descriptions of project activities, partners, clientele, staffing, and dissemination can also be found in the matrix of projects at the end of this section.

B. Procedures for Studying Implementation

The implementation analysis included four data collection steps. The first two steps were carried out with FY1988 grantees. Shortly after the evaluation began (March 1990) the evaluation staff refined a set of implementation issues outlined in its technical proposal, selected nine Year One grantees for further study (based on a preliminary evaluability assessment), and conducted a telephone survey of the nine grantees (April, 1990). Immediately after the telephone survey, the team conducted visits to eight of the nine grantees. All the visits were completed by the end of June, 1990, when most of the Year One projects ended.

These two data collection steps (telephone survey and visits to eight projects) yielded data that were the basis for the implementation portion of the Year One report. They also provided the evaluation team with the opportunity to reflect on the original design and make some minor modifications. These changes were discussed earlier in this chapter.

The two data collection efforts in Year Two were considerably more ambitious. After OMB clearance, a systematic mail survey was mounted with questionnaires distributed to all 30 grantees. Despite initial mailings by the OVAE program managers and extensive telephone follow ups, only 26 grantees (87 percent) returned questionnaires. (Results are reported for 27 grantees, however, because one grant yielded two sub-grants with unrelated projects.) Names of respondents are included in Appendix F, the report of survey findings. The survey was followed by two-day visits to 19 of the 30 FY1989 grantees.

The site visit teams used a similar protocol to the one used in Year One, although a few changes were made during the OMB clearance procedure. As in the first year, the study team prepared site visit reports. The site visit information was then condensed into three- to four-page descriptions (see Appendix E). Based on the descriptions and discussions with site visit teams, the study team created the data displays at the end of this section summarizing the qualitative data obtained from each site.

The Year Two data collection efforts form the basis for the results reported in this chapter. Specific information from the mail survey is referenced in the text. For some issues, the study team relied more heavily on site visit information. For others, the study team relied primarily on information derived from the survey. The study team tried, whenever possible, to supplement one with the other.

C. Major Findings from the Implementation Study

1. The Nature and Breadth of Training

There are several dimensions along which the training efforts of FY1989 projects may be discussed. One dimension is simply the extent of training, i.e., the number of hours, weeks, or months that students typically participate. A second dimension is the content of the training--is it detailed, job- or equipment- specific instruction, an overview or introduction to a field with generic as well as more specialized information, or is it refresher basic skills instruction in preparation for occupationally-specific instruction later. Individual Cooperative Demonstration projects reflect all of these kinds of training, and several projects combine several different kinds of training.

The amount and content of training is also related to other factors, the most important of which is probably the clientele. Specialized instruction may be more appropriately delivered to some clients than others, notably to persons who are already engaged in occupations akin to the area of instruction.

Amount of Training. The FY1989 projects that were visited offered relatively short educational programs. Although the designs of the various projects ranged from workshops of less than a day to two-year programs yielding associate degrees, the majority of projects developed short-term offerings. Many of the projects provided training to more than one clientele or for more than one type of job, with the amounts of time varying by clientele and position.

The shortest training efforts were essentially workshops, i.e., programs of one day or less. These were commonly offered to business owners or employees, often to demonstrate new technologies or equipment. For example, one project provided weekly two-hour demonstrations of computer integrated manufacturing (CIM). Employers then signed up for short-term training in computer assisted drafting (CAD), computer assisted manufacturing (CAM) and other topics with training usually lasting one day. Another project offered four-hour workshops on disk operating systems (DOS), CAD and CIM. A third project introduced large numbers of employees in one company to a new data collection system, training them in three-hour sessions before work, followed by two weeks of on-the-job training (OJT).

Several projects were designed to offer 100 to 200 hours of instruction spread over a six-month period. For example, one project taught students a computer language, providing 108 hours over six months. Another project offered a series of semester-length courses in CAD and programmable logic computers. Two projects offered entry-level training programs for health-care technicians of less than six months duration. One project provided students a minimum of 12 hours a week of training in business and office skills, with students remaining until placed in jobs--typically about four months.

Another set of projects offered training lasting a year or less. These projects tended to offer a license or certificate at completion. One project created an 11-month program to train respiratory therapy technicians, while a second health-related project trained students as technicians in a variety of specialties through one-year programs. Another project established a six- (later eight) week overview and nine-month certificate program in precision metal fabrication and screw machine technology. One project trained disadvantaged adults in desktop publishing during a 400-hour program, while another developed the a one-year program in software applications.

A final set of training projects was designed as two-year programs leading to technical degrees or licenses. For example, one project designed a two-year training program in hazardous waste management. Another was initially designed as an 18-month training effort for radiology technicians but will be expanded to 24 months in the future. The one FY1989 project aimed at high school students created a two-year occupational "clusters" program with internships. Two grants supported institutional capacity-building efforts, with one school developing an associate program in advanced technology and the other revising an existing associate-level industrial technology program.

Projects aimed primarily at curriculum or product development are harder to characterize using the time dimension. One project developed a curriculum to train entry-level employees in semiconductor manufacturing over approximately 283 hours. The training portion of this project was intended to pilot test the product. Another project developed an 18-hour program for master electricians to enable them to install home automation systems. Three projects developed one or more videodiscs to be used in conjunction with ongoing training programs.

The relatively short duration of training observed in the 19 site visits was reflected by the findings of the survey of FY1989 grantees. Grantees reported that 68 percent of participants received between one and 100 hours of training, while 11 percent received 101 to 250 hours. Approximately 14 percent of participants received 1,000 hours of training or more.

There is a major caveat to note with respect to the hour totals, however--one that suggests that the actual number of grant-supported hours of training may have been lower than these numbers reflect. Not all projects reported total instructional hours received through the grant in the same manner. The questionnaire instructions asked for "hours of instruction...from the project during the grant period," but it was likely that at least some projects included total instructional hours received by participants, whether or not the training was project supported. For example, a project may have provided revised or additional services to an ongoing course or degree program. Some sites reported the total number of hours required to complete that course or degree program as the instructional hours received under the grant.

Training Content. As with the duration of training, there was considerable range in content areas. Most of the projects that received site visits offered training in three broad areas--manufacturing, health, or business/office. Projects in manufacturing appear to have been focused on both entry-level and more advanced skills, while the health and business/office projects were focused on the development of entry-level skills.

Projects offering manufacturing-oriented training tended to train participants to use similar types of high technology equipment. At least five of the projects taught students computer-assisted manufacturing applications including the use of CAD, CAM, computer numerical controlled (CNC) machining or programmable logic controllers (PLCs). An additional project taught the application of a specialized computerized manufacturing system for a particular plant. These projects tended to be short-term. Some began with demonstrations of the use of the equipment, followed by short classes for persons seeking to use the systems. Almost all the students in these projects were current employees of companies. The one exception was a two-year program in the use of CNCs aimed at women seeking work in manufacturing (although the majority of students in the program were men).

A few manufacturing projects receiving site visits did not fit the short-term/CAD-CAM model. These included a 48-month apprenticeship program for Electronic Instrument Repair Technicians (EIRT), an ongoing program in which the Cooperative Demonstration grant supported an 18-month portion; and the nine-month certificate programs in precision metal fabrication and screw machine technology. The model may also not fit precisely a project that trained pipefitters and millwrights to use a new, automated equipment system at a steel mill. The EIRT program and pipefitter/millwright programs were two of the most customized training efforts, geared to the specific machinery of the partner companies. Another project offered a wide range of entry-level programs for disadvantaged students, including a 254-hour basic machining course. Finally, one manufacturing project revised and expanded the offerings of an industrial technology program at a community college.

The health projects were generally of longer duration and were geared to entry-level technician positions. For example, one project trained students as licensed practical nurses (LPNs) and alcohol/drug counselors. It provided a year of specialized training and OJT combined with remedial basic skills. Another project offered both a 5.5-month training program for pharmacy technicians and an 11-month training program for respiratory therapy technicians. The longest such program for adults was 18 months and trained participants to be radiology technicians. All of these projects had a clinical component.

There were two health projects that did not reflect the health technician training profile. One developed interactive videodiscs that taught viewers to use volumetric pumps. It was designed to be used by students already familiar with intravenous fluid delivery and was tested in a refresher course for returning nurses. The other project cut across the health and business sectors, training disadvantaged persons for entry-level work in the health field, although much of the training was for clerical positions (i.e., medical transcription, medical records apprentice, medical unit clerk). Students in this project received an average of 120 to 140 hours of instruction.

In general, business/office projects that received site visits tended to focus on entry-level skill training, although the hours of training varied widely. Two projects were extensions of Job Training Partnership Act (JTPA) training programs. One provided a 400-hour training program in desktop publishing (as well as other, non-business offerings), while the other offered a set of 40 self-paced office technology courses. Students with prior typing skills also received unpaid work experience, and it was estimated that the typical student spent about four months in the program before finding employment. The high school office systems occupational cluster program was two years in length, with an internship of four to six weeks. Finally, one business grantee designed several different options, including a one-year program leading to a certificate in microcomputer software applications.

There were a few projects that included training in fields other than manufacturing, business, and health. As already noted, one project developed an 18-hour curriculum to enable master electricians to install home automation systems. In addition, one of the JTPA programs that offered a wide range of courses offered a 254-hour program in automobile repair. Two projects were focused on computer-related training, with one developing a six-month program in ADA computer language and another "packaging" a number of courses to create a two-year advanced technology degree.

Only a few of the projects that received site visits spent large amounts of instructional time on non-occupational training. The most common form was remedial basic skills instruction, which was provided in health projects and others geared to disadvantaged students. For example, the project providing training for medical/clerical entry-level work also provided students with a self-paced, computer-based, remedial skills program. The project to train LPNs and drug/alcohol counselors reported that it provided a total of 2,000 hours of remedial education. Also providing basic skills instruction were the apprenticeship project for EIRTs and the project to train entry-level workers in manufacture of precision metals. It was likely that more advanced academic skill instruction was included in the various certificate and associate level programs.

The relationship between industry and duration of training was reflected in findings from the survey of grantees. Respondents identified the industries in which they trained, and each response was then compared with the hours of training reported for participants in that project. Most of the students (82 percent) in projects that indicated manufacturing as an area of training received less than 100 hours of instruction (see Table III-1). This compares with 43 percent of students in business service projects and six percent in health care projects. Overall, health care projects delivered the largest number of hours of training, with most students (80 percent) receiving 250 hours or more.

In addition to occupationally specific training, a number of projects offered basic skills or other related instruction. According to questionnaire responses, the majority of the projects (16 of 27) provided non-occupationally-specific training. The most common forms of non-occupationally-specific training were provision of employability skills (13 projects), provision of basic academic skills, (11 projects), and provision of advanced academic skills (9 projects). Interestingly, there was little relationship between the field of

Table III-1

PERCENTAGE OF STUDENTS RECEIVING VARIOUS AMOUNTS OF TRAINING BY INDUSTRY+

Hours of Training and Percentage of Students Receiving Each Amount

Industry	Fewer Than 100 Hours (%)	100-250 Hours (%)	250-1,000 Hours (%)	More than 1,000 Hours (%)	Unknown (%)
Construction	72	18	10	3	0
Manufacturing	82	11	5	1	1
Transportation	48	8	11	31	1
Business Services	43	12	42	0	4
Health Care	6	12	17	63	0
Education	86	5	9	0	0
Multiple Industries	86	8	6	6	0

+ Industries with fewer than four responses omitted from analysis. Respondents could indicate training in more than one industry training or hours of training and the likelihood of non-occupational instruction, but projects geared to disadvantaged students were more likely to provide non-occupational training.

Clientele. Observations derived from site visits were reflected in survey findings as well. According to the survey, projects providing training in manufacturing were the most likely to indicate current employees as their primary clientele type. As shown in Table III-2, ten of 17 such projects indicated that current employees were their primary clients. Projects providing training in multiple industries also commonly indicated that they served existing employees (four of seven projects). Projects providing health care training were more likely to indicate that they served adults seeking work in a field or company (three of seven). Only one project providing health care indicated that it served current employees of companies as its main clients.

Projects offering training in business services were somewhat more likely than others to indicated that they served disadvantaged adults (two of five projects). Projects training for manufacturing and multiple industries were also more likely to be training persons employed full-time (see Table III-3). Although information on employment status of clientele was not available for all such projects, of the 16 projects training students in manufacturing for which data exist, seven indicated that 76 to 100 percent of students were employed full time, and an additional three indicated full time employment by 51 to 75 percent of students. In contrast, none of the six projects providing training in health care for which information was available indicated the 76 to 100 percent of students were working full time, and only one indicated that 51 to 75 percent were working full time.

Summary. Overall, projects provided relatively short-term training. Survey results indicated that most participants received training of less than 100 hours. Projects included in the site visits can be grouped loosely into the following three categories:

Table III-2

MAIN INDUSTRIES AND PRIMARY CLIENTELE+
(NUMBER OF PROJECTS)

Industry+	Number of Projects*	Current Employees	Adults Seeking Work in Field or Company	Disadvantaged Persons	High School Students
Construction	4	2	1	1	0
Manufacturing	17	10	3	3	1
Transportation	4	0	1	2	1
Business Services	5	1	1	2	1
Health Care	7	1	3	2	1
Education	4	3	0	1	0
Multiple Industries	7	4	2	1	0

+ Categories are derived from open-ended question and are not mutually exclusive. Industries with fewer than four responses omitted.

* Adds to more than 27 because projects could select more than one industry.

Table III-3

MAIN INDUSTRIES AND CLIENTELE EMPLOYMENT STATUS DURING TRAINING

Industry+	Number of Projects*	Percent of Participants Employed Full Time During Training				
		0%	1-25%	26-50%	51-75%	76-100%
Construction	4	0	0	1	2	1
Manufacturing	16	1	2	3	3	7
Transportation	4	1	0	2	1	0
Business Services	5	1	1	2	0	0
Health Care	6	2	0	3	1	0
Education	3	0	0	1	0	2
Multiple Industries	7	0	1	1	2	3

+ Industries with fewer than three responses omitted.

* Projects on Manufacturing, Health Care and Education are each one fewer here than in Table III-2 because of missing data.

- Short-term, skill-specific instruction for current employees of companies or for persons already familiar with the field of training. This approach was most common among manufacturing projects, but it could also be seen in the refresher nursing course and in business projects teaching specific software applications, as well as home automation installation. These projects rarely provided formal credentials. Some instruction was customized, tailored to the needs of specific employers.
- Medium-term, entry-level technician training. These were programs in which training ranged from a few months to a year, often aimed at helping unemployed or otherwise disadvantaged persons find jobs in a field. These programs cut across the industries but were quite common in business. The three programs run by JTPA-supported agencies fell within this category, one of which provided training in several fields. Some provided certificates.
- Longer-term programs aimed at two-year certification or degrees (associate degree, license). Some of these projects were aimed at institutional capacity-building and regular students; e.g., creating new or revising existing offerings within departments of industrial technology or business/ computers in community colleges. One was an apprenticeship training project, and one an occupational project for high school students.

Not all 19 projects that received site visits fit neatly into one model, and a very few may not fit at all. But most could be identified within one or more of these groupings, which provided some sense of the range of programs developed and training delivered under the Cooperative Demonstration Program.

2. Type and Intensity of Public/Private Cooperation

The Cooperative Demonstration Program was designed to encourage cooperation between educational institutions and the private sector. As the program's grants announcement noted:

> High technology training can be conducted most effectively with the active involvement and cooperation of the private sector. Effective partnerships between the private sector and public agencies in vocational education are an important aspect of the Cooperative Demonstration Program...

The announcement anticipated that the partnerships established by the project would provide models of effective cooperation. To understand the nature and extent of cooperation, the FY1989 respondents were asked numerous questions about their projects' public-private partnerships. The following discussion presents the survey results first, followed by findings from the site visits.

Survey Findings. Most projects established relationships with employers. Of the 27 respondents, 23 indicated some involvement of employers in the planning or administration of the project or in providing services. Nineteen projects indicated multiple types of partners, including schools or universities (institutions that may serve the "private sector" cooperative role or may be involved in the project in some other manner) and community-based organizations (ten projects).

Although employers were involved in 23 projects, not all those projects indicated that private businesses were the most important partner organizations. Only slightly more than half the projects (14 of 26) indicated that the most important partner was a private business. Of the remaining projects, five indicated that the most important partner was a trade association or consortium, four indicated an educational institution, and three indicated a non-educational public agency. For the grantees that had second partners, these partners were even less likely to be private businesses (nine of 20) and more likely to be trade associations (four of 20).

Most grantees formed partnerships with only a few organizations, but some established multiple partnerships. Six projects had one private sector partner, and 16 projects had four partners or fewer, but seven projects indicated that they had ten or more partners. Given this range in the number of partners, it was likely that the roles of partners differed considerably across the projects.

In fact, differences in partner contributions were considerable. When asked to rank in importance a list of possible activities for the most important partner organization, there was little consensus among the grantees. The most commonly selected first choice activity for the partner organization was that it provided equipment for training, but that choice was selected by only seven grantees. Five grantees indicated that the partner's main contribution was identifying job skills, while four indicated that the partner recruited students for training. Three indicated that the partner served on a project advisory committee and two indicated that the partner supplied instructors. In short, there was considerable variability in first partner contribution--a variability that was sustained when the first through third ranked activities were added together. The same findings held true for second partners and, in fact, the variability in contribution increased.

The differences in activities may be, in part, a function of the nature of the partner relationships. Based on categories developed from site visits to first year grantees, the evaluation team identified several ways to characterize or summarize the relationships between grantees and employers. Each FY1989 grantee was asked to pick the choice that best characterized its relationship with its first partner. The majority of grantees selected one of the following two choices:

- The partner was a customer of the project, e.g. the project provided customized training to the partners' employees (selected by nine grantees); or

- The partner shared actively in the delivery of instruction and services (selected by nine grantees).

No other choice was selected by more than three grantees (see Table III-4).

Projects with multiple partners were more likely to report that the partners were customers, while projects with few partners used partners in more ways. Of the nine projects selecting "customer" as the main relationship, five also reported seven or more partners. In contrast, eight of the nine projects indicating that partners shared in instruction reported six or fewer partners. In addition, projects with six or fewer partners reported other uses of partners (advisory committee member, resource provider, initiator of project) while none of the projects with seven or more partners selected any of these categories.

In most of the projects, the grant did not result in establishment of a new primary partnership. Nineteen of 27 grantees reported that the relationship between the grantee institution and the partner organization was not new, but all 19 indicated that the relationship had been strengthened as a result of the project. The eight projects that did establish new relationships with the first partner organization were more likely to have encountered problems. Three of six projects that reported problems with their first partner had new partners, and two of these partnerships were dissolved by the end of the grant.

Grantees were slightly more likely to have established new partnerships with their second partners. Eight of 21 second partners were new, which appeared to reflect a wider range of relationship types. Considerably fewer second partners were project customers (two), though a sizeable number (eight) shared in delivery of instruction and services. This difference between first and second partners may have occurred because second partners were more likely to be trade associations or other educational institutions rather than

Table III-4

NUMBER OF PARTNERS AND NATURE OF MOST IMPORTANT PARTNERSHIPS (NUMBER OF PROJECTS)

	Number of Projects With	
Nature of Partnership	1-6 Partners	7 or More Partners
Partner Was Customer of Training	4	5
Partner Served on Advisory Board	1	
Partner Provided Resources to Project	3	
Partner Participated Actively in Service Delivery	8	1
Partner Initiated Project	2	
Other	1	1
Unknown	1	

employers. Second partners were somewhat more likely to serve primarily as members of advisory committees.

Site Visit Findings. Among FY1989 grantees that received site visits, partners and their roles ranged widely. In a majority of cases, grantee institutions formed partnerships with a small number of private companies (or associations) that performed roles such as serving on advisory committees, loaning or donating equipment or facilities, or helping to identify the skills needed in the jobs for which training was provided. This was the case, for example, for the college that created a CNC training program aimed at attracting women, the college that established an advanced technology center that delivered courses to employees of local companies, and the county vocational center that taught ADA computer language. But in several projects, the study team saw different types of relationships, related directly to the way in which the project was organized and the services delivered.

The first type of cooperation was intensive customized training. In two projects, the private employer was either the initiator of the project or played a central role in design and service delivery. Both of these were customized training projects in which the employers were steel mills. In one case, the company had already established an apprenticeship program for repair technicians (EIRT). It had paid for curriculum development by an instructor at a nearby college and needed a process control lab for instruction. The company approached the college to apply for Cooperative Demonstration funding. As the grant could not pay for equipment, it was used to subsidize training and the steel company paid for the lab equipment. In the other case, a college and a steel company worked jointly to develop training that enabled over 1,500 workers to implement new, high-tech milling equipment. The company paid for curriculum development and supplied training space, OJT, user support teams, plant floor support teams, and vacation reimbursement for the time workers devoted to training before work hours.

Other projects reflected the customized training model in somewhat less intensive form. Several projects began by trying to enlist students through convincing employers that training could benefit them and their workers. Projects staff then worked with individual employers to develop instruction tailored to the needs of their companies, and employees received short-term training. In these cases the training was not quite as customized (CAD, CAM, etc.). Most of these projects hoped to continue after the grant by generating fees from the businesses for the same or similar forms of instruction.

The second type of relation ship was recruitment by the grantee and referral to the partner for training. In these cases the grantees--some of which were administered by agencies that receive ongoing support from JTPA-- were community-based agencies (or other entities) that recruited participants. They might also assess the students' skills before referring them to another institution for training. They viewed their primary partners as being the colleges, technical institutes, or other institutions (such as hospitals) that provided the actual training. These grantees tended to view the private sector primarily as potential employers. Potential employers, such as welfare agencies, might also refer persons to the grantees. These projects tended not to have advisory committees of employers, but stayed in contact through efforts to place students in jobs. One such project described itself as "managing" a partnership of training institutions and potential employers.

The third type of relationship occurred in projects focused on curriculum development. The projects used schools or other instructional settings to "test" their offerings, and private sector partners (businesses or associations of businesses) as ongoing reviewers of materials. Some also used the employers to obtain initial information on skills that was then incorporated into curriculum development. The projects aimed at instruction in semiconductor manufacture, manufacture of precision metals, use of volumetric pumps, development of high school occupational clusters, and installation of home automation operated in this manner. Because the high school and volumetric pump projects also involved internships, the employers also supervised the students who were piloting the approach and provided feedback.

Summary. In many projects, then, the nature and organization of project activity was linked to the type of partnership that arose. Among projects included in site visits, intensities of partnerships varied from the two projects where a single employer played a critical role in service development and delivery, to projects in which employers might do little more than attend meetings of an advisory committee. Overall, intensity of partnership may be less significant than number of partners in determining partner role. Survey results show that projects with multiple partners were considerably more likely to report that partners were customers, while projects with few partners used partners in more ways, including active sharing of instruction.

3. The Meaning of High Technology

The projects also reflected different interpretations of the Congressional mandate that projects involve high technology. As indicated previously, the evaluation identified four basic ways in which FY1988 projects incorporated high technology in developing their programs and delivering training. Projects were high-tech in that:

- Training was designed to prepare students for jobs in fields that manufactured high-tech products or serviced high-tech equipment;
- Training was designed to enable students to use high-tech equipment or products even though the field in which the equipment was used was not generally considered high-tech;
- Training was conducted on high-tech equipment, such as computers, CAD, or CIM equipment; or
- Training was offered in basic skills as preparation for specific occupational training in a high-tech field.

Survey Findings. FY1989 survey respondents were asked to select all the high-tech definitions above that were appropriate to their projects. Most respondents selected more than one response to describe their projects' high-tech elements. Therefore, the study team created one response category for each project for further analysis:

- Training for high-tech field--11 respondents;
- Training for high-tech equipment in non-high-tech field--nine respondents;
- Training for both high-tech field and for using high-tech equipment in a non-high-tech field--three respondents;
- Training on high-tech equipment--one respondent;
- Basic skills training to prepare for further training in a high-tech field--two respondents; or
- Basic skills training utilizing high-tech equipment in preparation for further training in a high-tech field--one respondent.

Using these categories the study team first observed that most of the projects (23) defined "high-tech" in terms of the occupation or equipment for which training was provided. Of the 23, about half (11) were explicitly preparing students for immediate or specific work in high-tech fields. Most of the others (nine) were preparing students to use high-tech equipment or products in a non-high-tech field, with the rest doing both. If these answers were indicative, the remaining four projects were not preparing students for explicit high-tech applications, but rather defined their projects' high-tech element in terms of the equipment used in training or the students' long range occupational goal.

Second, the study team examined the extent to which the 23 projects that defined their high-tech focus in terms of occupation or field application also used high-tech equipment or provided basic skills instruction as part of their activity. The study team found that of the projects that prepared students for work in high-tech fields, the vast majority (eight of 11) used high-tech equipment in training (see Table III-5). Among the projects preparing students to use high-tech equipment in non-high-tech fields, however, only a slim majority (five of nine) conducted training on high-tech equipment. Since these projects were explicitly preparing students to use high-tech equipment or products on the job, the lack of training on such equipment in a majority of them was surprising. It suggests that the training may have been quite limited in scope.

The projects preparing students for using high-tech equipment in non-high-tech settings were also more likely not to offer basic skills instruction. Only two of the nine such projects indicated basic skills instruction, compared with six of the 11 projects preparing students for jobs in high-tech fields. This finding also suggests that the training for use of high-tech equipment in non-high-tech fields may have been rather limited or narrow in scope.

Projects that included manufacturing as an area of training were considerably more likely than others to prepare students for work in high-tech fields. Eleven of 17 such projects (65 percent) prepared students for high-tech fields (see Table III-6). Projects described as training for multiple industries also were weighted toward preparation for high-tech fields, with four of seven selecting this choice. This compares with only one of seven projects that provided preparation for health care jobs. None of the four projects that included training for the transportation industry indicated it was training for a high-tech field, and business service projects were about equally divided between high-tech and non-high-tech fields

Site Visit Findings. The site visit results parallel those of the survey, although sites that were visited tended to do more training for use of high-tech equipment. Most of the projects were preparing students to use high-tech equipment on the job, whether or not the field for which training was conducted was itself high-tech (see matrix of projects at the end of this chapter). Many of the projects also

Table III-5

EXTENT TO WHICH PROJECTS THAT PREPARED STUDENTS TO WORK IN HIGH-TECH FIELDS OR WITH HIGH-TECH EQUIPMENT TRAINED STUDENTS ON HIGH-TECH EQUIPMENT OR IN BASIC SKILLS

High-Tech Definition of Project	Trained on High-Tech Equipment		Taught Basic Skills	
	Yes	No	Yes	No
a. Prepared Students for Jobs in Fields Manufacturing or Servicing High-Tech Products n=11	8	3	6	5
b. Prepared Students to Use High-Tech Products Although Field Was Not High-Tech n=9	5	4	2	7
Both a. and b. n=3	2	1	2	1

Table III-6

PROJECTS' HIGH-TECH FOCUS AND MAIN INDUSTRIES OF TRAINING (NUMBER OF PROJECTS)

Industry+	Number of Projects*	a. Trained for High-Tech Field	b. Trained for Using High-Tech Equipment but Field Isn't	a. + b.	Other (See Text)
Construction	4	1	2	1	
Manufacturing	17	9	5	2	1
Transportation	4		3		1
Business Services	5	2	2		1
Health Care	7	1	5		1
Education		2	1		1
Multiple Industries	7	4	2		1

+ Industries w/fewer than four responses omitted from analysis.

* Adds to more than 27 because projects could select more than one industry.

used high-tech equipment, especially computers, in the course of instruction, but only one project appeared to meet that high-tech criterion alone.

Initial concerns that projects might not have a high-tech focus did not appear to be have been reflected in practice. This was primarily true because almost all fields have some high-tech elements. If a business project was training students to use word processing it was teaching students to use "high tech" equipment. The same was true for an auto mechanics project that was teaching students to use sophisticated diagnostic equipment. There was almost no field in which certain high-tech elements did not exist. Because the Cooperative Demonstration Program made no distinction between operating equipment and understanding how it functions, the requirement that the project be high-tech in focus excluded virtually no training effort.

4. Operation and Integration of the Demonstration within the Institution

There were numerous reasons to examine whether projects were able to start and operate effectively, and whether they were eventually integrated into their institutions. Because this was a demonstration program, the regulations envisioned wide replication of project efforts. For a project to be replicable, however, it must be sufficiently active (or its products available) for others to adopt it after Federal funding ends. In addition, because the grant period was short there had been concern that 18 months might not be sufficient for the projects to start, complete their activities, and generate continued support. In Year One, several of the projects experienced start-up problems that delayed services and made completion of objectives difficult. As a result, the study team asked a number of questions designed to examine start up, project operation and continuation beyond Federal funding.

There appeared to have been fewer start-up problems among the FY1989 grantees than among FY1988 grantees, but problems remained. Problems were generally of three types--those that were primarily administrative, those that were the result of incomplete or unworkable plans for the projects, and those that resulted from the economic downturn that affected some communities and sectors of the economy.

Administrative Issues. According to survey results, most of the FY1989 grantees said their projects would not have existed without Federal support. Of the 27 projects, only four indicated that the project would have existed without the Federal funds. Three of those four were providing grant-related services prior to the start of the grant. At the completion of the grant period, 14 projects expected that they would continue in their entirety, with another eight indicating that they would continue in a scaled-down form. Two projects indicated that their Federal funding had not yet lapsed.

Projects generally began to provide direct services to clients within a few months after the start of their grants, but a few did not provide services for many months. Excluding the three projects that were providing service to clients before the grant began, 12 projects began providing services within three months of grant award, and nine more began within nine months. Three projects did not start, however, until ten to 12 months after the grant awards (or six to eight months before the grants were originally due to end!).

Nonetheless, the grant period appears to have been sufficient for many of the projects to become institutionalized or find other sources of support. Twenty-two projects indicated they continued beyond the end of the grant. The most common sources of support among continuing projects were funds from the grantee institution (11 respondents), with private employers the second most common (eight respondents had commitments from employers and four others were waiting for final agreements). Five respondents planned to charge students tuition for project services. Of course, students were also likely to pay regular college tuition in projects indicating they would continue with institutional support.

Interestingly, the ability of projects to provide services soon after the grant award appeared to make little or no difference in whether they continued services beyond the grant period (see Table III-7). In fact, there was a slightly greater tendency for projects that

Table III-7

DATE OF PROJECT SERVICES START-UP AND LIKELIHOOD OF CONTINUING AFTER END OF FEDERAL GRANT
(NUMBER OF PROJECTS)

	Project Continued After Grant			
Project Provided Direct Services	In Entirety	In Scaled-Down Form	Did Not Continue	Still Funded (Extension)
Before Grant	1		1	1
As Soon As Grant Began	3	3		
1-3 Months After Award	2	3		1
4-6 Months After Award	2			
7-9 Months After Award	3	2	1	
10-12 Months After Award	3			

began providing services last to continue, with all of the latest-starting projects continuing in their entirety after the completion of the grant. Two of the three projects that indicated they were providing services before the grant started either received extensions to December, 1991, or were no longer providing services at the time of the survey.

Yet, when asked directly about factors affecting their ability to complete their original plans, the short grant period was cited as problematic by the largest number of respondents. Nine projects indicated that they encountered some problems in completing their original plans. The most commonly cited reason for implementation problems was that the 18-month grant period was insufficient, a reason cited by five of these nine projects. Also noted by more than one project were difficulties in staff recruitment and/or retention (two projects) and planned activities that proved inappropriate (two projects).

At the same time, however, ten projects indicated that they had accomplished activities they had not originally planned. The most commonly cited additional activity was curriculum development (five projects), followed by partner recruitment (four projects), and dissemination (three projects). Over half of these projects (six) indicated that they obtained additional funds that enabled them to undertake these unplanned activities.

During site visits, the details of several administrative problems were apparent. At least three projects encountered some difficulty finding project directors or other staff. The reason was usually the same--it was hard to find talented persons willing to take on 18-month, closed-end positions. In some cases the situation was complicated further because project positions were temporary or part-time and, hence, did not include benefits. Overall, however, these problems may have occurred less often in the second year because the recession may have made people more willing to take less attractive positions (and also because several projects involved a continuation of activities begun under previous Cooperative Demonstration grants).

Problems in Implementing Project Design. Almost all the projects encountered some problems in implementing their original design, but the intensity of problems varied considerably. One of the most common problems among the projects visited was an inability to recruit special populations. Many of the projects that had originally planned to focus training on disadvantaged persons either shifted their emphasis to other clienteles or simply recruited fewer minorities or nontraditional students than originally anticipated. The result, overall, was that the projects did not attract substantial numbers of minorities or nontraditional students by gender.

The reasons for problems in recruiting varied. One project that originally planned to focus on JTPA-referred students found that its advisory committee of local businessmen insisted on a level of training that demanded academic skills few JTPA-referred students possessed. As a result, this project shifted its focus to training current employees of companies in the area. Ironically, it found that many of these students also lacked sufficient math skills to do the work, and instructors ended up teaching basic skills to the employee population.

Several projects made efforts to recruit black and Hispanic students but met with little success. One project attributed its lack of success to its inability to provide a technician credential to program completers, making it an unattractive 18-month investment. Another project was housed in a facility many miles from the grantee's main campus, in an area that had no public transportation. A project that depended on obtaining training from schools that were accustomed to payment from JTPA found that the schools were unwilling to take risky students--people who might not finish the training--because they were used to the JTPA payment-for-performance approach.

The results of these problems can be seen in the survey findings on project participants. Males were the largest number of training recipients (see Table III-8). For the 79 percent of participants for whom gender data was provided, 67 percent were male and 33 percent were female. Further, males were concentrated in the projects providing training in manufacturing, while females were concentrated in the

Table III 8

PARTICIPANTS BY SEX AND RACE/ETHNICITY
(NUMBERS BY SEX, PERCENTAGES BY RACE/ETHNICITY)

		Number of Participants			Race/Ethnicity					
Project Name	Participant Total	Male	Female	Unknown	White	Black	Hispanic	Asian	American Indian	Unknown
Alabama Aviation	517	461	46	10	75%	14%	0%	0%	0%	11%
Ben Hill-Irwin	32	NA	NA	32	NA	NA	NA	NA	NA	100
Bronx Community College	NA	NA	NA	NA	NA	NA	NA	NA	NA	100
Center for Occupational Research and Development	24	21	3		83	0	17	0	0	0
Clackamas Community College	1344	954	390		97	1	.8	1	1	0
Columbia Basin College	855	759	96		NA	NA	NA	NA	NA	99
Fox Valley Technical College	216	183	33		99	0	0	0	1	0
Hampden County City Employment and Training Consortium	150	119	31		49	16	19	3	3	10
Home Builders Institute	17	17	0		94	0	.6	0	0	5
Howard Community College	29	1	28		90	3	0	3	0	3
Illinois Eastern Community College	19	16	3		100	0	0	0	0	0
Indian Hills	99	27	72		99	0	0	0	0	0
John M. Patterson	102	98	4		88	12	0	0	0	0
LTV Steel	28	28	0		57	21	25	0	0	0
Luzerne County Community College	58	34	24		83	0	0	0	0	17
Nebraska Department of Labor	39	3	36		97	0	3	0	0	0
North Clackamas School District #12	59	22	37		98	0	0	0	0	2
Northampton County	252	148	4	100	61	0	.4	0	0	39
Partners for America Vocational Education	255	62	193		7	85	3.5	1	0	4
Fresno Community College	124	108	16		56	5	29	8	0	2
Valencia 1	486	19	467		58	5	5	5	.2	29
Valencia 2	603	422	181		0	0	0	0	0	100
Valencia 3	1076	806	270		0	0	0	0	0	100
Waubonsee	172	11	161		51	21	24	4	0	0
West Virginia Community College	1589	0	0	1589	0	0	0	0	0	100
West Virginia Department of Education 1	63	15	48		90	10	0	0	0	0
West Virginia Department of Education 2	9	7	2		100	0	0	0	0	0

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projects providing training in business services and health care. Five of the six projects providing training in health care and three of the five reporting training in business services reported a female population of 50 percent or greater, compared with only two of the 16 projects offering training in manufacturing and one of the four projects offering training in transportation (see Table III-9). Although most projects (19) indicated that they made special efforts to attract women, it would not appear that the projects provided a testing ground for nontraditional training by sex.

For the 21 projects that reported the race of most or all participants, the vast majority of trainees were white. In these projects, whites constituted approximately 83 percent of participants, blacks were 11 percent, Hispanics were five percent, Asians were one percent, and American Indians/Alaskan Natives were less than one percent. Overall, then, whites constituted a greater percentage of participants in these projects than they were in the population. Fewer than two percent of participants were of limited English proficiency. Although 19 grantees said that they made special efforts to recruit minorities, among the 21 projects that supplied information, the projects appear to have done little to demonstrate new opportunities for minorities. However, the seven projects with missing data on race include about half the participants. Even if minorities were well represented among their participants, they would not have received much training because these projects also reported the fewest training hours per person.

The majority of trainees were employed full-time during training. Of the 87 percent of participants for whom employment status was reported, 85 percent were employed full-time during the period of training. Further, most of these persons were employed by the private sector partners that cooperated in the projects. Of the 80 percent of full-time employees for whom the employer was known, 92 percent were employed by a partner company. The total percentage employed by partners was probably somewhat less than this figure, of course, because employment by the partner was more likely to be known to the

Table III-9

FEMALE ENROLLMENT AND INDUSTRY OF TRAINING
(NUMBER OF PROJECTS)

Industry of Training+	Number of Projects*	Female Enrollment is Less Than 50 Percent	Female Enrollment is 50 Percent or Greater	Missing
Construction	4	3	1	
Manufacturing	17	14	14	1
Transportation	4	3	3	
Business Services	5	2	2	
Health Care	7	1	1	1
Education	4	2	2	1
Multiple Industries	7	5	5	

+ Industries w/fewer than four responses omitted from analysis
* Projects add to more than 27 because projects could select more than one industry .

grantee. Nonetheless, it is possible to conclude that the main training recipients were full-time employees of partner organizations.

Projects reported some problems due to the logistics of getting and maintaining plant and materials. For some projects, projected facilities and equipment contributions did not materialize. One project failed to gain the funds to build a clean room that was critical to its training plan. Another did not obtain the large training facility it anticipated in its grant application. One project found that loaned equipment was expensive to transport and maintain, presenting an unanticipated cost to the project.

Other projects simply could not execute the designs they originally proposed and had to make changes or curtail their offerings. One project planned to develop a specialized home automation system, but the developers of the system did not cooperate in curriculum development. As a result, the project staff had to alter its plan and develop a generic home automation installer curriculum instead. Another project found that it was much harder than anticipated to "sell" businesses on the need for company-wide CIM reforms, and instead offered short-term courses in specific computer-assisted applications. The three projects that planned to develop interactive videodiscs underestimated considerably the amount of time necessary for product development. None of the three had developed comparable software in the past. The project for high school students found it could not train students as groups during their internships, and asked students to maintain journals instead. The staff also found that internships planned to occur during the school year had to compete with many other out-of-school activities. Most of these problems were resolved, but for some projects the changes affected their ability to complete work within the 18-month grant time frame.

The Economic Downturn. Finally, some projects faced problems because of the economic downturn, although problems appear confined to a small subset of the projects visited. Most commonly, anticipated partner organizations were unable to participate or participated at severely reduced levels. Further, partners were unable to provide jobs for participants and completers. In one project, the projected partner laid off a third of its workers, including the person slated to be the main project liaison and an instructor in the program. In several projects, poor economic conditions led to low rates of student job placement. Nonetheless, the poor economy does not appear to have affected the majority of projects--especially those in industries such as health care where the conditions may not have been as adverse.

These site visit findings were borne out by the survey results. About half the grantees (14) indicated that economic conditions in their communities had deteriorated since they applied for grants (mid-1990), but fewer indicated that the changes had affected implementation of the grant. When asked whether the decline had affected grant implementation, four said that the changes had resulted in fewer jobs for students and four indicated that it had resulted in problems for the institution.

Grantees were slightly less likely to indicate that a decline in economic conditions in the specific industry or occupation in which training was provided had affected project operations. Over half the respondents (16) indicated a deteriorating economic condition in the specific field(s) of training, but only half of those indicating a negative economic change also indicated that it affected project operations. Six of these cited poorer job prospects for students as an outcome, while three indicated a negative effect on the institution. Two grantees indicated that negative changes in the industry created a positive opportunity for the project by increasing training needs, and one grantee indicated that better economic conditions in the industry led to fewer training opportunities at the institution. These last responses may reflect a common finding that bad economic times, while creating poor job prospects, can sometimes translate into increased enrollments in training. Not only do the unemployed seek training, but persons who are concerned about losing their jobs may also enroll.

Deteriorating economic conditions appear to have been most common among the projects that provided training in manufacturing (see Table III-10). Seventy-one percent of the projects that provided training in

Table III-10

MAIN INDUSTRIES AND LIKELIHOOD OF ECONOMIC CHANGE OVER PAST TWO YEARS (NUMBER OF PROJECTS REPORTING)

		Industry Conditions		
Industry+	Number of Projects*	Improved	Deteriorated	Remained the Same
Construction	4	0	1	3
Manufacturing	17	2	12	3
Transportation	4	0	2	2
Business Services	5	1	2	2
Health Care	7	1	2	4
Education		0	2	2
Multiple Industries	7	1	4	2

+ Industries w/fewer than four responses omitted from analysis.

* Adds to more than 27 because projects could select more than one industry.

manufacturing reported that economic conditions in the industry of training had deteriorated since the grant application. Among those grantees providing training in health care, only 29 percent reported deterioration, while among those providing business services, 40 percent indicated economic deterioration in the industry. As trainees in projects offering manufacturing training were the most likely to be full-time workers during the training, however, the economic deterioration may not have translated into immediate job effects.

5. Exportability of Project Activities and Products

Because this was a demonstration program, the study team sought to determine what project features had applicability to, or could provide useful models for, other educational or employment training programs. What elements of these projects were worth replicating widely, as had been anticipated by the regulations governing this program?

Survey Findings. The projects were quite divided in choosing features of their projects that could be used or applied by others. Respondents were provided with a list of possible project features and asked to rank up to three features of their projects they considered applicable or useful for others. The most commonly selected first choice feature was customized training for a particular employer or group of employers (six respondents). The second most commonly selected feature was a new or improved curriculum (selected by five respondents). "New or improved kind of training," "established or strengthened public-private partnerships" and "applied high technology equipment to the delivery of training" received four responses each. Three projects chose "expanded access to training for disadvantaged or underrepresented groups." Only one selected "model of school-to-work transition," which was a demonstration objective specifically identified in the Federal grants announcement.

This wide range of responses can be interpreted several ways. Given that the program was intended to be a demonstration of public-private partnership for training in high-tech fields, the lack of consensus on exportable features is surprising. One might have expected the partnership or training choices to account for a large number of first choices, but they account for only eight of 27. The selection of customized training as a first choice is notable, because, by its nature, customized training is rarely applicable across industries or educational institutions.

If all three choices are added together, however, establishing or strengthening public-private partnerships appeared to be the feature most commonly selected as having wider applicability. Twenty projects considered partnership among their top three exportable features. Conversely, few projects that did not select customized training as a first choice selected it second or third--making it one of the lowest ranked choices overall. Beyond partnerships, however, no exportable feature was identified by more than half the projects, even with first through third choices added together.

The lack of consensus on what is being "demonstrated" is troubling. While it is not possible to reach conclusions from the responses to one question, it seems that grantees do not appear to share a common view of what they used Federal support to "try out." And although all projects were expected to "try out" public-private cooperation for high-tech training, only 20 projects considered their new or improved public-private partnerships, and only 13 projects considered their training, as applicable to or providing a useful model for others.

Site Visit Findings. The site visit teams tried to make an assessment of what could be replicated from the various projects. They considered two criteria. First, they looked for some evidence that the project succeeded in accomplishing its goals, i.e., did it do something worth considering for replication elsewhere? If the project met the first criterion, it then needed a mechanism for facilitating replication--a product or other means for guiding others to implement the same set of activities.

For some projects, particularly those concerned with curriculum or product development, evidence of project success and replicability could be easily determined. These projects were, essentially, "tests" of the efficacy of the curricula or other materials/products (such as interactive videodiscs) the projects developed. The grants enabled the curricula or other products to be developed and installed in a pilot site or sites. The experiences of the users in those sites were observed and/or their comments solicited in a relatively systematic manner. Sometimes changes were made and the product was re-piloted. At some point, the developers were either satisfied or unsatisfied with the quality of the product.

There were only a handful of projects that proceeded in this manner, however. They included the projects that developed curricula for home automation installers, semiconductor manufacturing employees, and metal fabrication. They also included the high school occupational clusters training and the two projects that developed interactive videodiscs that can be used in instructional settings. All of these products have been pilot tested through the projects in one or more sites and were nearing or at completion at the end of the grant period. Seeing how well they can be used by persons not receiving direct assistance from the developers could be the next step in determining their exportability.

Beyond these projects, it less clear what project activities or partnerships were exportable or applicable elsewhere. First, some of the closest partnerships--such as the two steel industry projects--provided a training experience and direct instruction that may not have wider applicability. At best, they present a general lesson for others--that colleges can perform valuable assistance in helping manufacturers convert to the use of high-tech equipment. Working closely with managers, instructors can design and deliver a mix of classroom instruction and OJT to employees. Unfortunately, most of the projects were not accompanied by the kinds of documentation or process evaluation that would explain how such partnerships should or should not proceed to be most effective.

Second, beyond the curriculum or product development projects, the lack of systematic evaluations addressing project effectiveness makes it difficult to draw conclusions about project success (the evaluation's first criterion for replication). Most projects did engage "third-party" evaluators, but their evaluations either focused exclusively on process (i.e., they showed that projects met their obligations with respect to number of students, amounts of training, etc.) or lacked sufficient rigor with respect to assessing outcomes to reach conclusions. For example, a number of projects showed low rates of student placement. Because the projects did not conduct evaluations with comparison or control groups, it was impossible to know the extent to which the lack of placements was due to the poor economy or to inadequate project activities or procedures. It should also be noted that several projects did not have completed "third party" evaluations at the time of the site visit (although the vast majority of projects were completed or in their last month). Despite the "demonstration" intent of the Cooperative Demonstration Program, evaluation was treated in a pro-forma by many projects; it was largely an afterthought to service delivery.

A few projects did develop guides for implementing their procedures. For example, the project that assessed students and referred them for training to local schools and colleges produced a manual on its experience. Several projects provided the site visit teams with examples of curricula developed by staff supported, in part, with project funds. In the absence of any evaluations of the impact or effectiveness of these projects, however, it is hard to know whether to encourage others to use the same approaches, or even whether it would be worth the effort to test these interventions further.

D. Key. Findings

1. Project Training

Overall, projects focused on providing relatively short-term training. The typical participant received fewer than 100 hours of training. The projects included in the site visits can be grouped into a few basic categories:

- Short-term, skill-specific instruction for current employees of companies, or for persons already familiar with the field of training. This approach was most common among manufacturing projects, but it could also be seen in the refresher nursing course and in business projects teaching specific software applications, as well as home automation installation. Sometimes instruction was customized, tailored to the needs of specific employers.

- Medium-term, entry-level technician training. These were programs in which training ranged from a few months to a year, often aimed at helping unemployed or otherwise disadvantaged persons find jobs in a field. These programs cut across the industries but were quite common in business. The three projects run by JTPA-supported agencies fell within this category, one of which provided training in several fields. Some provided certificates.

- Longer-term programs aimed at two-year certification or degrees (associate degree, license). Some of these projects were aimed at institutional capacity-building and regular students, e.g., creating new or revising existing offerings within departments of industrial technology or business/computers in community colleges. One was an apprenticeship training project, and one an occupational program for high school students.

2. Partnerships

Among projects included in site visits, intensities of partnerships varied from two projects where single employers played critical roles in service development and delivery, to several projects in which employers did little more than attend meetings of an advisory committee. According to survey results, most partnerships fit one of two models:

- The partner was a customer of the project, e.g. the project provided customized training to the partners' employees; or
- The partner shared actively in the delivery of instruction and services.

Projects with multiple partners were considerably more likely to report that partners were customers, while projects with few partners used partners in more ways, including active sharing of instruction.

3. High Technology

Initial concerns that projects might not have a high-tech focus do not appear to be have been reflected in practice. This is true primarily because almost all fields have some high-tech elements. If learning to operate high-tech equipment is included as a training option, requiring that the project be high-tech in focus excludes almost no training effort.

4. Operation and Integration of Projects within Institutions

FY1989 projects reported fewer start up problems than did FY1988 projects. The 18-month time frame continued to present problems in completing project activities however. Whether a project started providing services shortly after award made little difference in whether it continued after the grant ended. The site visit teams identified several problems that cut across projects. They included: an inability to recruit special populations as planned, problems in getting and maintaining plant and materials, poorly developed designs that could not be executed, and underestimating the time necessary for product development. Aside from the recruitment difficulties, most problems were resolved but had an impact on those projects' ability to complete work within the 18-month grant time frame. The poor economy did not affect the majority of projects--especially projects in industries such as health care where the conditions may not have been as bad.

5. Exportability of Project Activities and Products.

Survey results suggested that projects lacked consensus on what it was that the Cooperative Demonstration Program was "demonstrating." Only 20 projects considered their public-partnerships, and only 13 projects considered their training, as applicable to, or providing a useful model, for others. Site visits revealed that most projects simply did not conduct the kinds of evaluations that would allow possible replicators to determine whether the project was successful for participants. Projects that developed and tested discrete curricula or products were more likely to have some evidence of effectiveness and a product to disseminate.

	Activity	Partnership
Bronx CC	School established an 18-month program to train radiology technicians for a hospital where a shortage existed. They sought nontraditional students. They also sought to get the program accredited. Activities/services included recruitment, program placement, tuition subsidy and stipends, training, academic tutoring, support services, advisement, job placement. Twenty-one students were recruited and 11 completed the training.	The original partner was Columbia Presbyterian Hospital, which was experiencing a shortage of radiology technicians. Montifiore Hospital was added during the project. In addition, the employee union (Hospital League 1199) provided tuition and loans to students who were union members. The hospitals provided equipment and the location for the clinical portion of the training.
Clackamas Community College	The project trained entry-level workers and upgraded skills of current employees in the manufacture of precision metals. The grant allowed the school to expand an existing program for the precision sheet metal industry, add a basic skills component, and target special groups including unemployed and displaced workers. Three new packages were developed: a) a six week (later expanded to eight) work-readiness basic course for entry workers which was offered six times: 79 students enrolled and 65 completed (52 placed, most of the rest continued their training); b) a nine-month certificate program in precision metal fabrication (15 enrolled, nine completed); and c) a nine-month certificate program in screw machine technology (15 enrolled, nine completed). The project used extensive methods to recruit students including producing two 10-minute PSA videos.	The main partners were the Oregon Precision Metal Fabricators Association (OPMFA) and the Northwest Screw Machine Products Association (NSMPA). They helped to identify skills, reviewed curricula, paid part of the cost of recruitment brochures and videos, advertised the project, recruited students, donated funds for equipment maintenance, and arranged for short-term training for project staff. They also arranged for equipment loans and staff training from private industry.
CORD	This project wrote, piloted, and disseminated a curriculum for current or prospective employees of semiconductor manufacturers. The curriculum was tested at two sites, providing 283 hours of training over five months to 16 employees of a semiconductor manufacturer and incorporated into a two-year program for 24 full-time students at Texas State Technical College (including construction of a clean room for OJT).	CORD worked with SEMATECH, a consortium of 14 semiconductor manufacturers, to develop contacts with these manufacturers. SEMATECH helped CORD to identify necessary knowledge and skills and assisted in curriculum development. The curriculum was used to train 16 employees of Micron, taking evening classes at Boise State University in Idaho, and 24 full-time students at Texas State Technical College.
Fox Valley Technical College	This project aimed to create a Computer Integrated Management (CIM) laboratory and provide CIM training and support for businesses in the area. It offered local business people CIM Solution Demonstration (obtained from partner organization)--a computer simulation of a CIM environment. The project developed videotapes that explain the advantages of CIM from various perspectives and provided weekly CIM demonstrations for businesses. The project offered short-term training in CAD, CAM, Metal fabrication, CIM, Technical publishing and quality control, as well as other applications. A total of 216 employers and employees participated in demonstrations and very short courses. Other students had courses with CIM curriculum components.	The main partner was IBM, which has created a CIM Alliance of schools across the country. Fox Valley joined the alliance which allows members to exchange and share curricula. IBM donated computers and software (including CIM Solution--which is an interactive videodisc). Businesses that obtained training could also be considered partners.
Fresno (State Center Community College)	The project developed an Advanced Technology Center (ATC), complete with new curricula, facilities, and equipment. The ATC developed a two-year training program in Hazardous Materials, and one or two courses each in Computer-Aided Design, Computer-Aided Manufacturing, and industrial electronics for a total of 124 students, 98 of whom were employees of businesses (many of whom were represented on the advisory committee). Most courses started as short-term but were changed to full semester courses.	The main partners were local manufacturing businesses that served on the advisory committee and helped in skills identification and curriculum development. Employees of some of these companies received training.
Home Builders Institute 128	Project planned to develop a curriculum and train master electricians and second-year apprentices to install and service SMART HOUSE--a home automation, energy distribution and control system. Due to delays in development of SMART HOUSE and inability to reach agreement with SMART HOUSE developers on the nature (and sophistication) of the training, project eventually changed to curriculum development and instruction in a more generic home automation system. As executed, the grant trained 16 instructors and 56 students at two institutions in the generic system. Training at one site was initially conducted by a consultant of Home Builders and later by a Home Builder trained instructor. Instruction at the other site was conducted by a trained trainer. Training was approximately 18 hours in length.	After the project moved to the generic approach, an advisory committee was formed that included manufacturers of home automation systems. In addition, the institutions that were pilot sites (Mid Florida Technical Institute and Tidewater Community College) are effectively partners. Advisory committee members reviewed drafts of the curriculum. Institutions provided students for training (and instructors for training as trainers). An additional institution was recruited as a training site but had not yet held any sessions as of end of 1991. 129

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	Activity	Partnership
Howard Community College	The project developed interactive videodisc technology for an existing refresher course for nurses returning to practice after an absence of five or more years. The interactive videodiscs were to enable students to practice the skills necessary to operate costly high-tech volumetric pumps without actually using it. The content and the scripts of the videodisc were developed by staff members at Howard and Essex Community Colleges, while the software and technical aspects of production were handled by a subcontractor. The interactive videodiscs were reviewed by students and instructors at seven institutions around the country.	Howard Community College worked closely with staff from Essex Community College to develop and refine the interactive videodisc, and both colleges provided classroom training for nurses taking refresher courses. The hospitals affiliated with these colleges, Howard County General Hospital and Franklin Square Hospital, respectively, provided clinical training for the nursing refresher students and reviewed curriculum as part of advisory committee.
Indian Hills	This project developed the second year of a diploma or associate degree technical program in two fields: Personal Computing and Advanced Technology. It also created several courses for students not pursuing degrees in these fields. Eight regular instructors/specialists at the institution and three industry representatives provided guidance to students along with project staff. Instruction was offered in evenings and was self paced, with facilitators present. Ninety-nine students participated in the project with 15 completions among the second-year participants and 14 among the single-course participants.	Key partners were Cargill, Inc. and Softactics. Representatives of both served on advisory committee and provided student advising on an "as needed" basis. Estimated time contribution of three industry representatives was 1 percent each.
Hampden County Employment and Training Consortium	The grant supported this JTPA organization to create Project High Tech '90, designed to recruit and train disadvantaged youth, women, minorities and underskilled adults. Seven training programs were offered in six fields and career education. Training was delivered through partner institutions (see partners). 125 secondary students received career education in nontraditional fields and 115 completed. Twenty students entered, 13 completed 400 hours in desktop publishing and printing. Basic machining training was 254 hours with 20 students, 12 completing (six placed). Auto repair was also 254 hours with 24 participating and 16 completing (eight placed). CAD/CAM was 96 hours, offered to 22 students with 18 completing (all already employed). Finally, 48 hours of instruction in CNC machining was provided to 15 employees of machine shops. Employability skills were also taught. Many of the courses had been developed under a previous Coop Demo grant.	The partners were the institutions offering the training. They included Springfield Technical Community College (career ed, CAD/CAM), Dean Vocational Technical High School (auto mechanics), Westfield Vocational Technical High School (CNC machining), and the Massachusetts Career Development Institute--MCDI (desktop publishing, basic machining). There was no advisory group; the grantee worked one-on-one with each school.
LTV Steel	This project provided support for 18 months of a 48-month apprenticeship program already developed by LTV Steel with assistance from the Calumet Campus of Purdue University. The grant paid for part of the training of the third cohort of apprentices; 28 students completed the 18 months--including 11 weeks of orientation (applied math, physics, etc.), 37 weeks on data collection and communication devices and systems, and 30 weeks on control devices and systems. The apprenticeship program for Electronic Instrument Repair Technicians (EIRT) began in 1988, necessitated by installation of new equipment as part of a massive capital upgrade. Training (over the 48 months) consists of one day a week at Purdue, one day in the employers' training facility and the rest OJT.	As the private sector initiated this project, the partner was the Electrical Engineering Technology Department at Purdue University-Calumet. Purdue assigned an instructor who developed the curriculum (prior to the grant) and taught the program. Curriculum development and equipment for a process control lab were paid for by LTV. In addition, the Joint Apprenticeship Committee (including management and USWA representatives), reviewed work processes in preparation for certification of the apprenticeship program (which was received from the USDOL in 1988).
Luzerne County Community College	This project trained "traditionally underrepresented groups" (41 percent were women). to use Computerized Numeric Controllers (CNCs) and developed two interactive videodiscs to simulate two different kinds of CNCs. Project staff intended to use the interactive videodiscs to train project students, but the development of the discs took longer than expected (one was completed). The project enrolled 58 students of whom 26 completed the program (two years). All of the completers were referred to employers; ten were hired, eight by partner organizations. Six students continued their education.	Four companies, one labor council, three development agencies, and three human resource agencies agreed to participate in the planning and operation of the project. The two most important partners were Mid-East Aluminum and Midway Tool. These partners helped project graduates find jobs, served on the project advisory committee, and provided facilities and instructors for training.

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	Activity	Partnership
Nebraska Dept. of Labor	Rural Allied Medical Business Occupation Program (RAMBO) operates employment and training programs under JTPA. RAMBO recruited disadvantaged students and coordinated support services, including remedial help and monetary support. The program provided medical training to disadvantaged students and placed students in medical occupations in rural Nebraska. The project enrolled 38 students, 26 successfully completed, including 22 completing as LPNs, three as drug and alcohol counselors, one in histology, and one as a certified respiratory therapist. All of the training programs were one year long and included classroom and OJT. Additionally, a total of 2,000 hours of remedial preparation was provided to the students. All but two of the 26 students who successfully completed the course were hired.	Central Community College provided classroom training to students. St. Francis Medical Center provided on-the-job training and some classroom instruction.
North Clackamas School District	The grant established two-year occupational cluster programs (called cooperative training units) in office systems, graphics technology, and health occupations at the district's Occupational Skill Center. Students served four-six week grant-subsidized internships at local companies. Approximately 49 students participated over the course of a summer and school year. Summer participants trained six hours a day but school-year participants trained somewhat less. They also took a mix of courses in their cluster. After graduation, eight of the initial group of 29 internship participants were hired by the companies under cooperative employment agreements.	The main partners included Northwest Regional Laboratory, which initiated the project and served as evaluator, as well as the three local companies that provided internships and cooperative learning sites. They were Precision Castparts Corporation, Block Graphics, and Providence Milwaukie Hospital. These companies had existing working relationships with instructors at the skills center. The companies provided orientation and supervision of interns, met weekly with teachers of the clusters, served on the advisory committee of the skills center, and reviewed the curricula.
Olney Central College	The project planned to train students as technicians or operators in semiconductor/chip fabrication through classroom and laboratory instruction. The laboratory portion would have required the construction of a clean room environment. In fact, the clean room was never established. The classroom portion (four-five courses per semester for one year) was offered, and 19 students enrolled and completed the year. The program was then terminated.	The partner was Intel Corp--located in Arizona, far from the Illinois school. It provided equipment, as well as advice on staff and curriculum development.
PAVE	Provided assessments of student vocational and academic abilities and interests and referred students to institutions and health training programs. Approximately 196 students enrolled in training at one of the institutions to which PAVE referred students, 139 participated and 104 completed training--which averaged 120-140 hours. Training was provided in five areas: nurse technician, medical transcription, phlebotomy technician, medical records apprentice, medical unit clerk. PAVE also provided academic remediation through a self-paced computer program called BASE.	PAVE indicates it oversaw partnerships between a coalition of health care employers and a coalition of educational institutions to which students were referred. Employers included Washington Hospital Center and Howard University Hospital. Students were referred for training in the D.C. Public Schools and University of the District of Columbia.
Southwestern Community College	Southwestern Community College proposed to develop a "Comprehensive Aerospace Manufacturing Technology Program" with four major components: recruitment, assessment and educational placement, training, and support services and job placement. As executed the project provided after-school academic tutoring for high school students, subsidized instructors to revise the industrial technology courses (make them competency based), developed internships for six students during 1990-91, and linked to NovaNet (interactive software with remedial basic skill and other programs).	The project planned a strong partnership with Rohr Industries, an aerospace manufacturer. Rohr was to provide the project with a full-time instructor/liaison, internships for project students, and jobs for SWCC graduates. SWCC was to provide Rohr with training for both workers and managers. As it turned out, Rohr laid off employees, including the full-time instructor/liaison, and couldn't provide internships or jobs. The project sought other partners: a Sanyo refrigerator factory took a summer intern, as did Corsair, a boat manufacturer.
Waubonsee Community College	The grant supported further expansion of a self-paced CETA/JTPA-developed office technology program at the school for students who are not JTPA eligible but need assistance. (Initial expansion had been supported by a previous Coop Demo grant.) Fifteen of the 40 courses offered were new. For example, typing and filing were switched from typewriters and file boxes to computers. The program provided child care. The program offered assessment and required students to attend for a minimum of 12 hours a week until they are placed or have achieved the level of mastery they seek. The program includes unpaid work experience for students with prior typing skills (15-20 percent of students were placed in internships). As of November, 1991, the program had served 172 persons. Some had been assessed and referred elsewhere, while others received training.	The partners were companies that had referred people to the program or hired participants in the past. One partner was the Illinois Department of Employment Security, which referred unemployed persons for training. Another was the Kane County Circuit Court which had hired students in the past. Another partner was the Kane County Department of Public Aid which both referred and hired in the past. There was no advisory board. Partner organizations suggested new courses and supervised the interns.

	Activity	Partnership
West Virginia Dept. of Ed.	This grant was effectively divided into two separate projects at two different institutions. A subgrant was made to Marion County Vocational Center for a program in ADA computer language. The program developed a curriculum and provided 108 hours of instruction in ADA computer language over six months as well as short workshops (of approximately four hours duration) for local business people in DOS, CAD, CMU. Nine students participated in ADA computer language and eight completed the 108 hours. Thirty-four people participated in business workshops. One new instructor was hired to deliver the program. A subgrant was made to Carver Career Center to establish programs in Pharmacy Technician and Respiratory Therapy Technician (vocational certificate programs). Existing curricula used in other institutions were adopted with minor modifications. The pharmacy program was 5.5 months duration and the respiratory program was 11 months duration. Two new instructors were hired to deliver the program. Thirty-four students enrolled in the respiratory program and 24 completed. Twenty-nine participated in pharmacy and 23 completed.	The Marion County program established a partnership with several local companies, whose employees were provided with workshops on DOS for managers. One company, J&S Machine Corporation, donated equipment and acted as liaison to local industry. Some relationships were new. Carver established six partnerships, including one with Charleston Area Medical Center. Partners donated equipment and served on an advisory board. Relationships were new.
West Virginia Northern Community College	This project provided upgraded training for existing Wierton Steel employees. Training provided included computer education for introduction of new IMIS data collection system and operation of new automated equipment for hot strip mill renovation (for pipefitters and millwrights). A total of 1,589 employees received some training--999 received the IMIS related training and the rest (590) received the automated equipment training. IMIS training was delivered before work shifts in three hour sessions followed by two weeks of OJT. The automated equipment training was provided 40 hours a week for five weeks. There were 44 curriculum modules developed--one for each IMIS machine. Employees who participated in training on their own time were compensated with additional vacation time. Many short-term trainers were hired for IMIS, and vendors were hired to provide automated equipment training.	Wierton Steel was the partner. It was not a new partnership as the school had formed a partnership with Wierton in 1987 to implement a Workplace 2000 adult literacy program. Wierton paid for IMIS curriculum development, provided training space, OJT, user support teams, plant floor support teams, and vacation reimbursement for training. The grantee indicates that the project would have occurred without the grant but at a considerably reduced level.

	High-tech focus	Start-Up vs. enhancement	Exportability
Broom CC	Preparation for work (occupational and basic skill training) in a field using high tech equipment.	This was a new program for the institution.	Curriculum was developed and modified based on curricula used by instructors in past teaching experiences.
Clackamas Community College	Students were provided entry-level skills and basic technician certificates for work in a high-tech field	Enhancement--partnership with associations for training began in 1988. A series of evening courses at a new 6,800 sq. ft. training facility were already taking place. The grant allowed the curriculum to be expanded to add basic skills, nine-month certificates and target special populations.	The metal fabrication curriculum was published in a book entitled The Shear Edge. The screw machine and competency-based curricula are also available and may have wider applicability.
CORD	This project developed a curriculum to enable high school graduates to work in semiconductor manufacturing, and to upgrade the skills of current employees.	New curriculum development project for a company with a track record in curriculum development of this type.	The curriculum developed by the project can be purchased by interested colleges. The third-party evaluator stated that the partnership and program development model were "exemplary" for high-technology fields.
Fox Valley Technical College	Project educated businesses to use CIM applications in manufacturing.	This project was an expansion of an already established goal of industry training. Component for undergraduate course focus on CIM was new.	Project indicates customized training as main contribution to others. Using CIM Solution Demonstration was a new approach for Fox Valley. They did, however, develop videotapes that explain CIM to business people.
Fresno (State Center Community College)	This project established an Advanced Technology Center (ATC) and developed curricula to teach students and employees how to use high-tech equipment and software packages in manufacturing industries.	Start up--the ATC was established under this grant.	The project director indicated that most ATCs are in hard-hit industrial areas, while Fresno is largely an agricultural area, where the potential users of high-technology equipment are in food-related industries such as processing and packaging plants. The establishment of the ATC is also part of an effort to attract nonagricultural industries to Fresno.
Hampden County Employment and Training Consortium	Students were preparing to use high tech equipment in fields not usually considered high-tech (auto repair, graphics, machining).	Enhancement--this project recruited new groups and adapted an existing curriculum to new audiences. The project infrastructure and partner organizations were the same as for an earlier Coop Demo grant.	The curriculum packages developed by the project (and previous grant) are provided free to anyone requesting copies. The packages are suitable for use by other vocational schools and technical colleges. Procedures for recruiting students may be of use to other schools--one partner school has begun to use them.
Home Builders Institute	The project trains participants to install high-tech equipment.	This project was a new curriculum development effort for Home Builders Institute, although SMART HOUSE was a spin off of the National Association of Home Builders, the Institute's parent organization.	The curriculum can be used by many other institutions (and Home Builders can train others to deliver it).
Howard Community College	The project used a high-tech instructional system, interactive videodiscs, to teach students to use high technology medical equipment, namely, volumetric infusion pumps.	Videodisc development was a new activity. The grant allowed incorporation of the interactive videodiscs into its ongoing nursing refresher course, which was developed earlier under a grant from the State of Maryland.	Once completed, the interactive videodiscs on volumetric infusion pumps will be sold to any interested nurse training programs.
Indian Hills	Project provided preparation for jobs in high-tech fields (also used computers in training).	This project built on existing course and degree structure--adding courses for new specializations. It also used existing staff to deliver instruction.	The laser courses are now offered to lay people and secondary school teachers through IHCC's continuing education program. The self-paced courses are usable by other schools and available on request.
LTV Steel	Students were preparing to repair high-tech temperature, pressure and flow measurement instrument components as well as interfacing digital and analog electrical systems.	Enhancement--all the project components were already operational. Because of the Federal subsidy for the training, LTV agreed to donate $150,000 in equipment for a process control lab at Purdue.	Unique nature of LTV's production process and equipment makes training of limited use to other institutions. However, the instructor has incorporated elements of curriculum in his regular classes at Purdue.

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	High-tech focus	Start-Up vs. enhancement	Exportability
Luzerne	The project taught a high-tech manufacturing skill (CNC operation) and developed a high-tech method of delivering training (interactive videodisc).	The project modified existing courses in CNC, CIM, and math to meet lower ability levels of students seeking nontraditional career paths. Project relied on LCCC developmental study course for remediation where needed and added internship component for all students. All staff were already on board except the secretary.	The interactive videodiscs will be exportable to other institutions and job-training sites that have interactive video equipment and want to train students on CNCs, but do not want to buy the actual CNCs, which are expensive.
Nebraska Dept. of Labor	According to the questionnaire, "training provided students with necessary high-tech training for entrance into medical field."	New start up	Site visitors felt that the partnership among the Department of Labor, Central Community College, and Saint Francis Hospital was an exemplary model for the training and placement of disadvantaged students in high-demand occupations.
North Clackamas School District	The office system and graphics training provided students with skills in using high-tech equipment (primarily computers and specialized programs), although the high-tech element in the health program is unclear.	Start-up: This was a new program for the district and the skills center although the partners were businesses with whom instructors had previous involvement. Most of the school-year courses were already provided, but many were revised as a result of the students' experiences during the internships.	Potential model of secondary training for transition to work--but program has not been assessed.
Olney Central College	Project was to prepare students for assembly in a high-tech manufacturing field.	This was a new project for the school.	A paper and manual were completed, but the termination of the project makes exportability doubtful.
PAVE	Remedial training used computers and some of the students may have been preparing for health care jobs that involved use of high-tech equipment.	An enhancement: PAVE was already providing the referral services informally prior to the grant, but the formal coalition of health care providers and educators was new.	PAVE believes they have developed a model of "third party" management of a coalition of educational institutions and employers--called a "managed partnership." PAVE has written a manual with guidelines about its experience.
Southwestern Community College	Courses available at SWCC dealt with manufacturing engineering, computer-aided manufacturing, industrial engineering, and quality engineering.	Enhancement--the project was linked to existing services, such as mentoring and counseling. This was an institutional capacity-building project.	Because the partnerships and other elements did not develop as planned, exportability of process is unknown.
Waubonsee Community College	Program offered training for persons with a wide range of prior office skills. Most students received training to use high-tech equipment, although some courses did not appear to have a high-tech focus.	Enhancement--This project was an extension of an ongoing program. The main difference was extending the program to persons with assets too great--but hardly excessive--to allow them to qualify under JTPA.	Open entrance-exit and self-paced structure could be exported but are not well documented. Copies of curriculum packages are available to other institutions on request.
West Virginia Dept. of Ed.	Marion and Carver prepared students for jobs in high-tech field and used high-tech equipment in training.	The Marion County program was described in the questionnaire response as an enhancement. The Carver project was described as new.	ADA curriculum guides have been circulated state-wide and nationally, although exportability may be difficult due to the advanced nature of the computer language and need for DOS knowledge. The Carver programs can be used successfully by other vocational centers.
West Virginia Northern Community College	The training prepared students for use of high-tech manufacturing equipment--although field is not generally considered high tech.	Start up. This was a new area of training for WVNCC, which hired many persons as short-term trainers and hired vendors to provide training as well.	The highly customized training makes exportability problematic, except for use by other steel mills using the same equipment. Model of partnership can be of use for other manufacturing plants and colleges.

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	Clientele	Staff	Dissemination	Problems
Bronx CC	Completers included: four U.S. born whites, one Hispanic, and six recent immigrants (three Russians, one Iranian, one Trinidadian, one Barbadan)	Three new instructors, one of whom was also the program director, were hired. The project director was already employed by the college. They did curriculum development as they introduced new courses.	Information about the program was disseminated to all NYC/City University of New York (CUNY) colleges. Articles about the program were also published in local newspapers, the CUNY press, and in RT Image, a major trade journal.	Despite considerable efforts, the project was unable to attract black and Hispanic participants. Project staff thought part of the problem was that it was an 18-month program, which meant students were not eligible for certification at completion. The program is being expanded to 24 months so students will be eligible.
Clackamas Community College	Applicants were assessed using standard college placement exams in reading and math. Those who did not pass were referred to refresher math courses. A total of 79 students entered the work-readiness program, and 65 completed. Of the 79--35 percent were female, and 18 percent were minority. Approximately 80 percent of graduates were placed in jobs. Ten of the graduates entered the certificate program or other education. Of 16 students in precision metal fabrication, 12 were male and two were minorities--nine graduated. Of 16 in screw machine technology, 15 were male and none were minorities--nine graduated.	The three primary instructors all came from industry and had no prior teaching experience. Staff for the work readiness and certificate programs attended a "train the trainer" pre-service program in the summer prior to instructing. They also intended an in-service seminar later in the year. CCC faculty also received training on equipment loaned by vendors--including several weeks visiting vendors' sites.	See Exportability.	Lack of public transportation to the project site (18 miles from campus) made it almost impossible for target population to attend. Local economic downturn made it difficult to place graduates. Finally, donated equipment was expensive to transport and to maintain, an unanticipated cost. Instructors had to spend time finding additional resources and materials.
CORD	The project provided training to 20 employees of Micron, a semiconductor manufacturer, and 24 students at Texas State Technical College. Of the 20 Micron employees, 16 completed. Of the 24 TSTC students, two dropped out (the rest won't finish until May 1992). Of the 24 TSTC students, eight were low-income, and six were unemployed.	CORD had seven staff members on the project: one president/CEO, one project director, two research associates, one director of special projects, one senior research assistant, and one clerical assistant. Texas State had four staff members on the project: one division director, one program chairman, one instructor, and one clerk typist. Boise State had five instructors on the project.	The Semiconductor Manufacturing Technology (SMT) model was presented at the National Coalition of Advanced Technology Centers (NCATC) fall and summer conferences. CORD gave presentations at Rensselaer Polytechnic Institute and Texas State Technical College. Information on the project was published in Economic Development, Commentary, and six issues of the NCATC Newsletter. The SMT curriculum will be sold to interested colleges.	The death of the director of SEMATECH delayed initial contact with semiconductor manufacturers, but, once established, contacts proceeded well. Apparently, TSTC had no "clean room," which was necessary to provide hands-on experience in manufacturing semiconductors. To overcome this difficulty, students helped to build a clean room, giving them additional, unforeseen work experience. Training schedule at BSU was unrealistic.
Fox Valley Technical College	Participants were local business people and employees of those companies. They were primarily male, white, and full-time employees. Fox Valley students were also participants in modified CIM-oriented curricula.	Project used existing instructors at the institution (grant paid for substitutes to free up regular staff time to work on project).	Presentations were made at two national vocational education meetings and at CIM Alliance meeting. Videos produced.	Project originally envisioned cadres of instructors advising on companywide introduction of CIM. This approach failed to develop. Companies preferred instruction in specific applications--CAD, CAM, and small training sessions.

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	Clientele	Staff	Dissemination	Problems
Fresno (State Center Community College)	The proposal stated that the project would serve mainly disadvantaged, unemployed, and refugee population; in fact, the project primarily served the employees of partner companies. Of the 124 students who received training, 108 were men and 16 were women, 29 percent were Hispanic, 5 percent black and 8 percent were Asian; 23 were unemployed.	Fresno Community College had seven staff members working on the grant. One was the project director, one was an administrative advisor, one was the project coordinator, and the other four were instructors.	The project director gave two presentations on the ATC, one to State Vocational Education Directors, and the other to a conference of the California Industrial Technical Educational Association. He also presented information about the project plan to the Nation Coalition of Advanced Technology Centers in May 1990.	According to project staff, the advisory board insisted on levels of training beyond what could be handled by most disadvantaged populations, making recruitment of these groups difficult. Promised donations of warehouse space and computer hardware for the ATC were never made. The original nine-week, 20-hour-a-week format proved too condensed for several of the classes, so they were reformatted to fit the standard 18-week, three-hour-a-week college semester format.
Hampden County Employment and Training	Project targeted special and nontraditional populations. A total of 204 students were enrolled--including 125 high school students --and 171 completed (including 115 high school students). Students were 19 percent Hispanic, 16 percent Black, 3 percent Indian. Twenty-one percent were female. A total of 20 (non high school) participants were placed in jobs--and the 15 CNC machining students were already employed.	Staff for the project included a Director, recruiter/evaluator, and an equity development specialist. There were five instructors from the partner schools, all but one of whom had worked on the previous Coop Demo grant. One project administrator also served as an instructor.	Project used newsletter to 600 individuals and organizations to publicize content, accomplishments. There were few requests for information, however. Two other grantees viewed the project. Copies of CNC curriculum mailed to anyone requesting them. Staff made presentations at State and national meetings, e.g. AVA.	Problems included a major economic downturn in the community leading to poor rates of job placement. In addition, staff indicated other problems including not screening training applicants for prior skill levels or motivation. Minority recruitment was difficult because partner schools were accustomed to JTPA payment, so did not want to take students unlikely to finish training or different from other students. Start of training at one institution was delayed three months while it searched for a new instructor (who then had little time to assemble his course).
Home Builders Institute	All participants to date have been master electricians or regular students at the schools that have "piloted" the curriculum.	Most staff were regular staff or consultants to Home Builders Institute. In addition, Home Builders staff/consultants have provided training at the institutional pilot sites.	None yet--curriculum was not yet completed as of the end of 1991.	The change from SMART HOUSE to generic home automation training coupled with staff changes (project directors) set this project back 12 to 18 months. When visited (November, 1991), curriculum was not yet completed and no training had been held in the third site that had been recruited. In addition, at least one of the institutions had signed on because of promises that staff would learn SMART HOUSE, so the project had to make good on that promise.
Howard Community College	The project provided a refresher course for 29 registered nurses who had not actively practiced nursing over the last five years. All but one of the 29 completed the refresher course.	Howard Community College had four staff members on the project, including the project director, a curriculum specialist, and two course coordinators. Essex Community College had one course coordinator on the project.	There has been little dissemination because of the delay in completing the interactive videodiscs. The project director has presented information on the videodiscs at several meetings. Howard Community College will sell the finished videodiscs in conjunction with SETS, the subcontractor that helped to develop the discs.	The development of the interactive videodisc took much longer than planned.

	Clientele	Staff	Dissemination	Problems
Indian Hills	Clientele was primarily women, described as nontraditional for the fields. One-third were low income, but there were no minorities.	Project used existing instructors and administrators. Were any project staff hired for the project solely?	Copies of curriculum packages sent to ERIC. Project staff made presentations at State and national conferences.	Project recruited fewer students than expected and had very few completions.
LTV Steel	Project served the third cohort of apprentices. All were hourly employees who applied and passed reading comprehension and math assessments. Selection is influenced by seniority and a consent decree LTV signed in 1974 that specifies minority representation in apprenticeship programs. Apprentices receive full-time wages. Twenty-eight males--15 white, six black, seven Hispanic--were in the third group and all completed the 18 months.	A single instructor from Purdue provided the classroom-based portion of the project. (He had previously developed the curriculum.) Other staff for the project included a project administrator and a general supervisor.	Copies of curriculum sent to US DOE, Bureau of Apprenticeship, and USWA collective bargaining unit. Information distributed to Lake County JTPA for consideration of independent craft training program. Purdue ran ad about program in Chicago magazine. U.S. Steel provided with information on program but USS developed a scaled-down version with another college.	The main problem LTV encountered was that some institutions approached to provide training were unresponsive. Even at Purdue, some faculty were unenthusiastic about teaching noncredit courses. The Purdue instructor encountered problems receiving tenure because of his private-sector teaching.
Luzerne	The project was intended to serve underrepresented groups, such as women, the handicapped, and racial/ethnic minorities. The college's Institute for Development Educational Activities (IDEA), would provide the client population with literacy and basic skills training, counseling, placement testing, and academic support services. The training was free to qualified students, who also received a stipend of $25 per week. Of the 58 students, 45 were unemployed, three had disabilities, and 10 were low-income.	The project had ten staff members. One was the project director and an instructor, seven others served as teachers, one helped produce the interactive video, and another worked as a secretary. All except secretary were regular LCC staff.	Staff exhibited interactive video program at Pennsylvania Technology '91, where they tried, unsuccessfully, to sell copies. No decision on further dissemination at time of site visit. Project obtained newspaper coverage on implementation of video. Local companies using CNC equipment have come to see the training for possible use. Copies of curriculum sent to ERIC.	The development of the interactive videodiscs took much longer than expected, so they were not available in time to train students in the project. A downturn in the economy made partner companies unable to provide on-the-job training for project students or jobs for project completers.
Nebraska Dept. of Labor	All 38 students served by the project were economically disadvantaged. Of the 38, 26 successfully completed training, and 12 dropped out. All but two of the successful completers were hired.	JTGN had one staff member, the director of the RAMBO project, on the grant. Central Community College had two staff members on the grant; one served as an educational program administrator, and the other "delivered educational services." Both had very light time commitments to the project (6 percent and 2 percent, respectively). Saint Francis Medical Center had one staff member, who interviewed participants and placed them in appropriate training opportunities, on the grant.	Information on the project was disseminated through television spots, newspaper articles, presentations at national conferences, and journal articles. All three partners gave presentations to: the American Society for Healthcare Human Resources Conference, the Adult Learner Conference, and the National Conference on Rural Adult Education Initiatives.	Problems included difficulty in retaining students and difficulties obtaining necessary waivers of State certification requirements.
North Clackamas School District	Office systems: 40 students per year; graphics: 40 students per year; health occupations: 40 students per year. There were no minorities, but more than half the participants were young women.	Five teachers provided instruction in the three clusters. There was also a full-time project coordinator. Teachers had weekly meetings with internship supervisors that enabled teachers to learn about changes in workplace and integrate findings into their programs.	See Exportability.	Program went pretty much as planned but found it difficult to train students as groups during internships (students kept journals instead). Also, school work kept length of internships during school year shorter. Six hours in summer, four or less during school year (employers wanted more). None of the health graduates could be hired by the partner because state regulations require postsecondary training for entry-level technicians.

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	Clientele	Staff	Dissemination	Problems
Olney Central College	Enrollees were primarily unemployed young white males (although special efforts were made to attract other groups). Three enrollees were female.	Current instructors at the institution provided instruction. A lab assistant was newly hired, and the partner was a paid consultant.	A paper was delivered to the National Association for Science, Technology, and Society at the Technology Literacy Conference. A SemiTop manual was disseminated to ERIC (Educational Research Information Center).	The project failed to establish the clean room laboratory necessary for Year Two of the project. As a result, students could not complete the program and it was discontinued.
PAVE	Most persons referred for training were black females, and about half were unemployed.	Grant used existing staff and courses of partner schools.	PAVE distributed its manual on its experience in establishing the program to state vocational education directors and state councils on vocational education.	PAVE notes that many persons who were referred for training did not actually show up for training. There was also a relatively high dropout rate during training even though the amount of training time needed for these programs was not great.
Southwestern Community College	The project had three target groups: local high school students, current SWCC students and people not employed in the aerospace industry, and employees of local aerospace companies.	Southwestern Community College had four staff members working on the project. One was the project director, one was the project coordinator, one was an educational liaison, and one was a secretary. Additionally, nine other people (from the college and partner organizations) were provided with stipends for curriculum development.	Project staff members gave a presentation on the implementation of Total Quality Management at an industrial engineering conference in New Orleans; gave presentations at two meetings of California Community Colleges, and gave a presentation at the Center for Applied Technology.	The downturn in defense procurements wiped out jobs for aerospace employees at all levels, a need that was one of the project's foundations. Especially damaging to the project was the layoff of a Rohr employee who was going to work full-time as an instructor and industry liaison. The proposed project coordinator decided not to work on the project because he could not wait for an uncertain grant. It took five months to find a new coordinator.
Waubonsee Community College	Almost all the trainees were women who did not qualify for JTPA because they owned homes or had other assets that precluded eligibility. They were described as divorcees, widows, and other persons in need of skills to earn a living. Almost half (49 percent) were minority and 24 percent were unemployed during training. Had to have a 10th grade reading level, a high school diploma/GED or be in a GED class.	Seven staff were all "part time (35 hours/week) and ineligible for benefits. New courses were developed by staff from available commercial curricula or program software. Staff made a point of not using regular college course curricula because of differences in courses and clientele.	The project director has spoken at several state and national conferences, e.g., AVA, and has arranged for articles about the project in local newspapers.	Part-time status of staff (no benefits) made recruitment and hiring of staff difficult.
West Virginia Dept. of Ed.	Marion County participants in ADA were primarily white males already employed full time during training. Carver participants were primarily white females. More than half were unemployed at the time of training.	One new instructional staff member was hired at Marion County and two at Carver. The project administrators were existing staff at West Virginia Department of Education, Marion County, and Carver.	There were TV and newspaper reports on the project, presentations at AVA, State Directors of Vocational Education meeting, National Association for Program Improvement in Vocational Education meeting. Project reports were distributed to State vocational education directors, NCRVE, ERIC, etc.	There was an unanticipated need to educate local industry to the value of ADA training as it was not immediately apparent. As a result, sizeable effort was redirected to short-term courses for managers in DOS.

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	Clientele	Staff	Dissemination	Problems
West Virginia Northern Community College	Current steelworkers and other Wierton employees were the participants. There is no information provided on characteristics, due to union regulations about confidentiality.	Seven full-time and five part-time instructors were hired. Vendors were hired to provide the automated equipment training. IMIS trainers received 40 hours a week of training for six weeks prior to instructing.	WVNCC and Wierton held a national teleconference to discuss partnerships, employees' fear of change, effectiveness of training. They also made presentations at two conferences, one national and one international.	Initial plan called for teaching statistical process control and other advanced training in connection with IMIS installation. Project objectives were changed (reduced) to providing instruction in data entry and orientation to computers because of a delay in installing IMIS.

Section IV

PROJECT COSTS AND BENEFITS

IV. PROJECT COSTS AND BENEFITS

Were project costs reasonable relative to the projected or actual outcomes of the project? Costs were defined as the Cooperative Demonstration grant plus non-Federal cash match and in-kind contributions of the grantee. The outcomes of the project are defined as numbers of students trained (if training is the project focus) and/or the number of course hours developed (if curriculum development the project focus). "Reasonableness" is judged by comparing costs and benefits among projects, not against some absolute standard. These analyses quantify major project outcomes and, where possible, the total costs of achieving them. No attempt was made to assign a monetary value to the benefits resulting from the project outcomes (e.g., the dollar value of learning a new skill). Also, the analyses excluded consideration of the costs in time and effort to students participating in the projects.

This section is divided into four subsections. Subsection A identifies major cost/benefit issues and the operational definition of those issues. Subsection B defines and enumerates project costs, and subsection C defines and enumerates major project benefits. Subsection D compares costs with benefits in accordance with the major issues raised in Subsection A.

A. Major Issues

Project costs and outcomes are aggregated to estimate overall costs and benefits. These are used to compute four measures:

- Treatment costs: total project costs minus planning and development costs;
- Project intensity: total treatment hours divided by the number of successful completions;
- Average unit cost of delivered services: total treatment costs divided by total units of service; and
- Service cost per unit of outcome: total treatment costs divided by the number of successful completions.

Operational definitions of treatment hours, successful completions, and units of service produced vary according to the type of treatment (e.g., training versus curriculum development). For projects focusing on student training, the number of treatment hours are the number of classroom contact hours; the successful completions are those students finishing the course; and units of service are hours of training per student.

The four measures were analyzed only for the 19 FY1989 projects for which data were collected during the site visits (see Section III). The site-visit teams collected limited cost and outcome data (e.g., project budgets and numbers of students trained) from each project through staff and partner interviews and review of budget and expenditure reports, project progress reports, and the mail survey of all FY1989 projects. Project records showed direct expenditures from grant and from non-grant sources. Partner organization members were interviewed to determine direct expenditures or in-kind contributions to the project. Finally, project staff were interviewed to identify other in-kind contributions to the project, such as donated equipment or release time from other organizations. Although not all in-kind contributions could be translated into dollars, the study team made rough estimates of the value of the contribution stated in the grant application or during staff interviews.

B. Project Costs

Project costs are the financial and nonfinancial resources used for project activities. Since Cooperative Demonstration grants required grantees to contribute at least 25 percent of total project cost, project costs include both the Cooperative Demonstration grant amount and grantee match. Project costs often included more than this, however. Some projects used existing instructional services paid by the grantee as part of their regular operations. Others used staff and materials funded from other sources to supplement the activities of the Cooperative Demonstration project. These outside sources also should be included in the calculations of total project costs. Thus,

Total Project Costs = Federal grant + non-Federal match + outside project resources.

Unfortunately, few outside sources could be included in the calculation because the grantee had not track them. Thus, the analysis is based only on the direct services and materials paid for with grant funds.

1. Cost Categories

The primary components of project costs used in the analyses were those in line-item budgets, including:

- Salaries and Wages;
- Fringe Benefits;
- Travel;
- Equipment;
- Supplies;
- Contractual Services;
- Other Direct Costs;
- Total Direct Costs; and
- Indirect Costs.

Salaries and Wages. Primary staffing costs were salary and wages paid to staff, including annual salary and hourly wages for all employees of the grantee--or the partner organization--who work on the project. Staff included teachers, instructors, administrators, other certified personnel, clerical staff, and support staff.

Fringe Benefits. Employees usually received fringe benefits as part of their compensation package, including sick leave, annual leave, holidays, health insurance, etc. Fringe benefits are usually established by the institution as a percentage of total salaries and wages.

Travel. Any travel costs were listed as a separate line item, including airfare, car rental, ground transportation, hotels, meals, and tips.

Equipment. Although the program discouraged FY1988 grantees from using grants to purchase equipment and prohibited it in FY1989, some projects did purchase new equipment. Other projects used non-Federal sources to pay for equipment.

Supplies. Projects required routine office supplies, specialized materials, and instructional materials.

Contractual Services. Some projects hired outside experts or temporary personnel, including outside evaluators or specialized services provided by other companies through contracts. Rules governing the use of consultants (individuals) differ from those governing the use of companies (subcontracts), but both involve the external acquisition of services and are grouped in one category.

Other Direct Costs. Direct costs that do not fit into the above categories are listed as "other costs" and may include space rental, telephone, and postage if they are not paid for indirectly (see Indirect Costs below).

Total Direct Costs. The sum of all the direct cost categories yields the total direct costs of a project.

Indirect Costs. Indirect costs are charges made by grantee institutions for overhead items such as office space, heat, electricity, postage, accounting services, and administrative services. Grantees usually provided these to all projects and programs. To pay for items that are difficult to itemize, the grantee institution charged projects an indirect cost, or overhead, rate. The indirect cost was usually based on a percentage of the total salaries and fringe benefits, but may also include other direct costs in the base. Under the FY1988 and FY1989 grant regulations, grantees were allowed to charge a maximum indirect rate of 8 percent.

Total Project Costs. Total project costs were the sum of all direct costs and all indirect costs associated with the project.

2. Sources of Funding

Projects funded activities from three major sources: grant funds provided by the Federal government through the Cooperative Demonstration Program grant award; non-Federal cash or in-kind resources from public or private organizations (e.g., the grantee or partner organization) to meet the required 25 percent match; and funds or in-kind contributions not identified in the grant application nor reported in the project expenditure reports (usually underlying instructional or support services provided by the grantee as part of the regular educational program). In-kind resources included grantee staff time, partner staff time, equipment, facilities, services, materials, and information. Grantees did not always identify these resources because 1) the grantee already had satisfied the 25 percent match, 2) it didn't have the resources to track them, 3) it needed them offset any of the 25 percent matching funds that may be disallowed in a subsequent Federal audit or 4) the accounting system could not handle them.

The total costs of each project and sources of funding are shown in Table IV-1. Total project costs ranged from $261,274 at Nebraska Department of Labor to $1,356,966 at Clackamas. It should be noted that grantees may have overestimated the value of the partner's contribution or given vague figures for equipment.

Table IV-1

TOTAL PROJECT COSTS

PROJECT	FEDERAL GRANT FUNDS	LOCAL CASH MATCH	LOCAL IN-KIND MATCH	OTHER PROJECT RESOURCES	TOTAL PROJECT COSTS
Bronx Community College	473,549	0	460,000	0	933,549
Clackamas Community College	366,305	0	990,661	0	1,356,966
CORD	417,880	8,270	110,662	117,755	654,567
Fox Valley Tech	437,727	0	0	326,900	764,627
Hampden County Consortium	359,309	0	124,800	0	484,109
Home Builders Institute	408,318	0	30,000	0	438,318
Howard Community College	214,924	77,997	15,325	0	308,296
Illinois Eastern College	178,270	0	105,400	196,571	480,241
Indian Hills College	239,089	98,434	48,736	0	386,259
LTV Steel Co.	252,821	839,319	0	0	1,092,140
Luzerne Community College	234,174	0	180,218	0	414,392
Nebraska Labor Department	171,874	0	89,400	0	261,274
North Clackamas Schools	257,274	23,850	138,930	185,000	605,054
PAVE	383,385	5,442	180,750	0	569,577
Southwestern College District	278,379	238,213	138,375	0	654,967
State Center College District	399,000	0	275,945	0	674,945
Waubonsee Community College	243,328	102,201	0	0	345,529
West Virginia Department of Education	377,086	11,884	196,686	0	585,656
West Virginia Northern College	471,808	0	161,439	200,986	834,233

* total project costs = Federal grant + local cash match + local in-kind match + other project resources.

C. Project Benefits

Project benefits are improvements in the ability and/or employment status of students or in the quality of vocational education. Some outcomes are quantifiable (e.g., the number of students successfully completing training), while others are nonquantifiable (e.g., a new way to identify skills needed by local employees). Nonquantifiable outcomes cannot easily be compared against project costs. Consequently, the following cost/benefit analyses use only quantifiable outcomes.

Quantifiable outcomes vary with the type of activity and the focus of the project. For example, the benefits of curriculum development are new teaching modules or materials. Benefits of dissemination projects include "how-to-do-it" descriptions of the project, publications and presentations, or greater awareness by other vocational education institutions. Similarly, benefits of training include the number of students with documented improvement in skill levels.

The Statement of Work (SOW) for this contract identified three quantifiable outcomes to be measured: 1) the total number of service hours, 2) the number of successful participants, and 3) the number of person hours of services received per participant. For projects aimed at improving vocational education, primary outcome measures were: 1) the total hours of student training provided, 2) the number of students completing the training, and 3) hours of training received by each student.

The grants funded other activities that provided services as well. Their value was measured through the three general measures defined above. The following are the quantificable outcomes, by type of activity, that were measured for each project:

Activity	Outcome
Student assessment	number of students assessed
Training students	number of students completing training
Staff development	number of staff trained
Curriculum development	number of course hours developed
Skills identification	number of industry skills identified
Dissemination/diffusion	number of other end users adopting product
Partnerships/networking	dollar value of partner(s) contributions

The major outcomes from each type of activity are summarized in Table IV-2. These measures do not capture all possible outcomes. Many important benefits could not be measured until after the end of the 18-month grant period. For example, while the number of students hired is one measure of the quality of training, no data on employment were available if the students had to undergo further training for a job or if they were already employed. The demonstrated mastery of technical skills is the ultimate measure of the effectiveness (along with job placement) of a new curriculum, but most projects did not conduct pretests because no such tests existed. Thus, available outcome measures often told what was done, but not how well it was done.

Table IV-2

SUMMARY OF PROJECT BENEFITS

PROJECT	STUDENT ASSESSMENT	STUDENT TRAINING	STAFF DEVELOPMENT	CURRICULUM DEVELOPMENT	SKILLS IDENTIFIC.	DISSEMINATION	PARTNERSHIP DEVELOPMENT
Bronx Community College	o national guidelines o prior educ.	o 11 students trained o 31,680 hours	o none	o 18 courses	o continual	o replication manual	o 2 hospitals o union
Clackamas Community College	o placement exam o interview	o 83 trained o 90,000 hours	o 5 trained o 215 hours	o 4 courses developed	o none	o conference present. o ERIC article	o 2 associations
CORD	o pre and post asset tests o coll. reqs. o in-class	o 40 students trained o 7564 hours	o none	o 23 courses	o advisory committee o CORD research	o conference present. o curriculum to be sold	o college o university o Micron o Sematech
Fox Valley Tech	o college reqs. o in-class	o 216 students trained* o 322,310 hours	o conferences o workshops o site visits	o 7 courses	o customized	o 5 videos o conference present	o IBM
Hampden County Consortium	o evaluate at 3 weeks	o 107 students o 151,298 hours	o one teacher trained OJT	o one course developed	o done by proj. staff	o proj. newsletter o visitors o conferences	o 10 partners incl. com. college and voc. h.s.
Home Builders Institute	o pre, mid, and post tests	o 35 students trained o 1,890 hours	o teachers trained as part of training	o one course developed	o partner o pilot test	o in progress	o Smart House o colleges
Howard Community College	o none	o 29 students trained o 145 hours	o none	o Interactive Videodisc developed	o advisory committee	o Videodisc to be sold o conference present.	o 2 hospitals o college
Illinois Eastern College	o pre-tests	o 12 students trained o 5,966 hours	o 7 staff o 140 hours	o 9 course modules	o experts consulted	o by request o conference present.	o Intel o Sematech o vendors
Indian Hills College	o electronics: pre-test o interviews	o 70 students o 25,470 hours	o none	o modified existing computer and math courses	o partner feedback o advisory board	o conference presentation o copies to ERIC	o 4 local companies

(Continued on next page)

Table IV-2, (Continued)

LTV Steel Co.	o reading & math test o plant seniority	o 28 students o 196,000 hours	o none	o none	o project staff	o none	o Purdue University
Luzerne Community College	o community college assessment battery	o 26 students o 1100 hours	o none	o one interactive module o one course	o advisory board o partner feedback	o conference exhibit o copies to ERIC	o 15 manufacturers
Nebraska Labor Department	o asset test o job skills	o 28 students trained o 31,379 hours	o LPN - informal	o some modification	o individual.	o conference present o journal articles	o medical center o college
North Clackamas Schools	o job interview	o 57 students o 8955 hours	o none	o enhanced existing computer courses	o project staff o partner feedback	o videotape o implement. guide o conf. pres.	o hospital o printer o manufacturer
PAVE	o vocational o basic skills	o 104 students trained o 154,440 hrs	o none	o some modification	o steering committee	o newsletter o distrib. to potential users	o 8 education o 15 health care
Southwestern College District	o interest & aptitude inventory	o 325 students trained o 5,500 hours	o dvlpmnt. of competency based curric. workshop	o 5 courses	o surveyed 30 firms o developed task lists	o conference present.	o Rohr o high schls. o 5 cos. o college
State Center College District	o skills pre o in-class	o 107 students trained o 11,991 hours	o 6 staff o 580 hours	o 16 courses	o advisory council	o conference present.	o 3 local companies
Waubonsee Communit College	o ASSET test o skills pretest	o 200 students o 147,400 hrs	o none	o 15 courses o 10 courses modified	o done by proj staff	o project newsletter o conference present.	o 12 public agencies
West Virginia Department of Education	o in-class	o 140 students trained o 30,382 hours	o ADA college courses o 6 sem hrs/yr	o 8 course modules	o advisory committee o consultants	o state voc. directors o teleconf.	o 2 univers. o local bus. o 7 hospitals
West Virginia Northern College	o proficiency demonstrated	o 1589 studs trained o 173,800 hrs	o 17 staff o 910 hours	o 44 modules o 280 hours	o defined by partner	o teleconf. o conference present.	o Weirton Steel

* number does not include degree students

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D. Cost/Benefit Analyses

Ideally, the project team would determine cost effectiveness by matching costs to specific activities and outcomes. However, the team could not collect cost data for each outcome separately for two reasons. First, grantees did not code expenditures by activity because their accounting system did not operate at that level of detail, i.e., expenditures were aggregated only according to budget line items. Second, several activities usually contributed to the same outcome--projects implemented activities or one activity was used to support more than one objective.

The team analyzed the three activities for which cost data were available through the grantee's accounting system or the final contract budget: planning and administration, student training, and curriculum development. Planning and administration costs include wages of the project director and clerical staff, associated fringe benefits, other direct costs associated with administration, and indirect costs. Student training costs include the wages of instructors and other specialists, associated fringe benefits, other direct costs (e.g., textbooks, supplies, travel, and stipends), and indirect costs. Curriculum development costs include the wages of instructors and curriculum development specialists, associated fringe benefits, other direct costs (e.g., training workshops, travel, and printing), and indirect costs.

1. Treatment Costs

The first major analysis separated planning costs from the costs of providing the service. Treatment costs equal total costs less planning and administrative costs:

Treatment Costs = (total project costs) - (project director wages + clerical wages + fringe benefits + other direct costs + related indirect costs)

Treatment costs and planning/administration costs for each project are displayed in Table IV-3. The proportion of total project resources devoted to planning and administration ranged from 9.5 percent at LTV Steel to 48.0 percent at PAVE.

2. Project Intensity

The intensity of the project (i.e., the number of successful outcomes relative to the effort expended to accomplish those outcomes) is defined as:

$$\textbf{Project Intensity} = \frac{\text{total treatment hours}}{\text{number of successful completions}}$$

The effort to train students was the sum of the hours students spent in training in all courses. The number of successful outcomes was the sum of the students completing training. In projects where the treatment was staff training, the number of successful outcomes was the number of teachers completing training. Project intensity for each activity for which data were available--training students and training staff--are displayed for each project in Table IV-4. The amount of training per student completed, project intensity, ranged from 16.92 hours at Southwestern Community College to 7,000 hours at LTV Steel. Staff training, offered formally at only three sites, ranged from 20 hours per teacher to 53.5 hours per teacher.

3. Average Unit Cost of Services

The average cost per unit of service is the total cost of the service divided by the number of units provided:

$$\textbf{Average Unit Cost of Service} = \frac{\text{total treatment cost}}{\text{total units of service provided}}$$

For example, total service costs for providing student training was the sum of the project costs for staff, materials, overhead, etc. for all the courses. Total service costs for curriculum development was

Table IV-3

PLANNING/ADMINISTRATION COSTS VERSUS TREATMENT COSTS

PROJECT	TOTAL PROJECT COSTS	PLANNING AND ADMIN. COSTS *	PERCENT	TREATMENT COSTS	PERCENT
Bronx Community College	933,549	181,883	19.5	751,666	80.5
Clackamas Community College	1,356,966	126,334	9.3	1,230,632	90.7
CORD	654,567	179,202	27.4	475,365	72.6
Fox Valley Tech	764,627	134,189	17.5	630,438	82.5
Hampden County Consortium	484,109	180,597	37.3	303,512	62.7
Home Builders Institute	438,318	139,092	31.7	299,226	68.3
Howard Community College	308,296	39,924	12.9	268,372	87.1
Illinois Eastern College	480,241	90,237	18.8	390,004	81.2
Indian Hills College	386,259	67,502	17.5	318,757	82.5
LTV Steel Co.	1,092,140	38,480	3.5	1,053,660	96.5
Luzerne Community College	414,392	96,136	23.2	318,256	77.0
Nebraska Labor Department	261,274	103,708	39.7	157,566	60.3
North Clackamas Schools	605,054	172,822	28.6	432,232	71.4
PAVE	569,577	273,470	48.0	296,107	52.0
Southwestern College District	654,967	124,995	19.1	529,972	81.0
State Center College District	674,945	57,143	8.5	617,802	92.0
Waubonsee Community College	345,529	85,051	24.6	260,478	75.4
West Virginia Department of Education	585,656	163,395	27.9	422,261	72.1
West Virginia Northen College	834,233	259,138	31.1	575,095	65.0

* planning and administration costs = project director wages + clerical wages + fringe benefits + other direct costs + related indirect costs

Table IV-4

PROJECT INTENSITY

PROJECT	TOTAL HOURS STUDENT TRAINING	NUMBER OF STUDENTS COMPLETING	PROJECT INTENSITY*	TOTAL HOURS STAFF TRAINING	NUMBER OF STAFF COMPLETING	PROJECT INTENSITY
Bronx Community College	31,680	11	2880			
Clackamas Community College	90,000	83	1084.34	215	5	43.0
CORD	7564	40	189.10			
Fox Valley Tech	322,310	216	1492.18			
Hampden County Consortium	151,298	107	1414			
Home Builders Institute	1890	35	54			
Howard Community College	4205	29	145			
Illinois Eastern College	5,966	12	497.2	140	7	20.0
Indian Hills College	25,470	70	363.86			
LTV Steel Co.	196,000	28	7,000			
Luzerne Community College	1100	26	42.31			
Nebraska Labor Department	31,379	28	1,120.7			
North Clackamas Schools	8,955	57	157.11			
PAVE	154,440	104	1,485			
Southwestern College District	5,500	325	16.92			
State Center College District	485,252	107	4535.07			
Waubonsee Community College	147,400	200	737			
West Virginia Department of Education	30,382	140	217.01			
West Virginia Northern College	173,800	1,589	109.38	910	17	53.5

$$\text{* project intensity} = \frac{\text{total activity hours}}{\text{number of completers}}$$

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the sum of project costs for staff, testing, reproduction, overhead, etc., for all the courses produced. Total units of service provided was the sum of all students entering training or the number of new courses.

Average unit costs for student training and curriculum development for each project are displayed in Table IV-5. The average unit cost for student training ranged from $.45 at PAVE to $40.47 at State Center.

Comparing the average cost-per-hour-of-training across projects may create an unfair comparison because of variations in the intensity of the training and the number of students being trained. These differences affect the comparison of costs for curriculum development. The average unit cost for curriculum development (cost per course hour) ranged from $1.69 at the West Virginia State Department of Education to $24,179.90 at Howard Community College. However, comparing the average cost-per-unit-hour for curriculum development also may be misleading. Howard's course was an interactive videodisc, which had a much higher initial development cost due to the technology used.

To provide a more accurate comparison, the analysis should compute the average cost per hour of training per student trained.

$$\textbf{Average Unit Cost of Service per Unit of Outcome} = \frac{\dfrac{\text{total service costs}}{\text{total units of service provided}}}{\text{number of completers}}$$

Table IV-6 shows the per-hour per-student costs for the projects. The per-hour per-student costs range from $.001 at West Virginia Northern to $9.24 at Luzerne Community College. The costs for the remainder of the projects tended to concentrate under $1.00 an hour.

4. Service Cost Per Unit of Outcome

The service cost per unit of outcome is defined as total service costs divided by the number of completions:

$$\textbf{Service Cost per Unit of Outcome} = \frac{\text{total service costs}}{\text{number of successful completions.}}$$

Table IV-5

AVERAGE UNIT COSTS OF TREATMENT

PROJECT	TOTAL HOURS OF STUDENT TRAINING	TOTAL COSTS FOR STUDENT TRAINING	COST PER HOUR OF TRAINING *	TOTAL HOURS OF CURRICULA DEVELOPED	TOTAL COSTS FOR CURRIC. DEVELOPMENT	COST PER COURSE HOUR
Bronx Community College	31,680	692,683	21.86	1,080	56,233	52.07
Clackamas Community College	90,000	1,088,516	12.09	2,180	99,387	45.59
CORD	7,564	224,729	29.71	1,247	215,102	172.5
Fox Valley Tech	322,310	557,906	1.73	2,892	66,140	22.87
Hampden County Consortium	151,298	240,100	1.59	400	35,000	87.5
Home Builders Institute	1,890	41,801	22.12	18	232,044	12,891.33
Howard Community College	4,205	21,979	5.23	10	241,799	24,179.90
Illinois Eastern College	5,966	210,119	35.22	570	23,192	40.69
Indian Hills College	25,470	276,189	10.84	23,790	41,986	1.76
LTV Steel Co.	196,000	1,030,264	5.26			
Luzerne Community College	1,100	264,263	240.24	200	51,294	256.47
Nebraska Labor Department	31,379	136,430	4.35			
North Clackamas Schools	8,955	355,902	39.74			
PAVE	154,440	70,200	0.45			
Southwestern College District	5,500	218,642	39.75	240	124,740	519.75
State Center College District	11,991	485,252	40.47	1,122	84,126	74.98
Waubonsee Community College	147,400	253,851	1.72	737	6,460	1.69
West Virginia Department of Education	30,382	305,828	10.07	2,274	74,133	1.69
West Virginia Northern College	173,800	301,440	1.73	280	237,952	849.83

$$* \text{ average unit cost} = \frac{\text{total treatment costs}}{\text{total units produced}}$$

Table IV-6

AVERAGE UNIT COSTS PER UNIT OF OUTCOME

PROJECT	TOTAL HOURS OF STUDENT TRAINING	TOTAL COSTS FOR STUDENT TRAINING	COST PER HOUR OF TRAINING	NUMBER OF COMPLETERS	COST PER HOUR PER STUDENT *
Bronx Community College	31,680	692,683	21.86	11	1.99
Clackamas Community College	9,000	1,088,516	12.09	83	.145
CORD	7,564	224,729	29.71	40	.743
Fox Valley Tech	322,310	557,906	1.73	216	.008
Hampden County Consortium	151,298	240,000	1.59	107	.015
Home Builders Institute	1,890	41,801	22.12	35	.632
Howard Community College	4,205	21,979	5.23	29	.180
Illinois Eastern College	5,966	210,119	35.22	12	2.94
Indian Hills College	25,470	276,189	10.84	70	.155
LTV Steel Co.	196,000	1,030,264	5.26	28	18.79
Luzerne Community College	1,100	264,263	240.24	26	9.24
Nebraska Labor Department	31,379	136,430	4.35	28	0.155
North Clackamas Schools	8,955	355,902	39.74	57	.700
PAVE	154,440	70,200	0.45	104	0.004
Southwestern College District	5,500	218,642	39.75	325	.122
State Center College District	11,991	485,252	40.47	107	.378
Waubonsee Community College	147,400	253,851	1.72	200	.86
West Virginia Department of Education	30,382	305,828	10.07	140	.071
West Virginia Northern College	173,800	301,440	1.73	1,589	.001

$$\text{* average unit cost of service per unit of outcome} = \frac{\dfrac{\text{total treatment cost}}{\text{total units of treatment provided}}}{\text{number of completers}}$$

The number of successful completions is defined as the sum of the students completing the training and the number of courses successfully developed. The unit service costs for training students and curriculum development are shown for each project in Table IV-7. Service costs for student training ranged from $190 at West Virginia Northern to $62,971 at Bronx Community College. For curriculum development, the cost per course ranged from $233 at Indian Hills to $241,799 at Hampden. The relatively high cost at Hampden County again was due to the high cost of the interactive videodisc.

In summary, the answer to the question "are project costs reasonable in relation to project outcomes?" appears to be yes for all projects. The per-unit and per-outcome costs for all the other projects tended to cluster in the same area even though total costs and project intensity varied substantially.

Table IV-7

SERVICE COSTS PER UNIT OF OUTCOME

PROJECT	TOTAL COSTS FOR STUDENT TRAINING	NUMBER OF COMPLETERS	SERVICE COST PER STUDENT *	TOTAL COSTS FOR CURRICULA DEVELOPED	NUMBER OF COURSES DEVELOPED	COST PER COURSE
Bronx Community College	692,683	11	62,971	56,233	18	3,124
Clackamas Community College	1,088,516	83	13,114	99,387	4	24,846
CORD	224,729	40	5,618	215,102	23	9,352
Fox Valley Tech	557,906	216	2,582	66,140	7	9,448
Hampden County Consortium	240,100	107	2,243	35,000	1	35,000
Home Builders Institute	41,801	35	1,194	232,044	1	232,044
Howard Community College	21,979	29	758	241,799	1	241,799
Illinois Eastern College	210,119	12	17,509	23,192	9	2,576
Indian Hills College	276,189	70	3,946	41,986	18	233
LTV Steel Co	740,042	28	26,430			
Luzerne Community College	264,263	26	10,164	51,294	2	25,647
Nebraska Labor Department	136,430	28	4,872			
North Clackamas Schools	355,902	57	6,243			
PAVE	70,200	104	675			
Southwestern College District	218,642	325	672	124,740	5	24,948
State Center College District	485,252	107	4,535	84,126	18	4,673
Waubonsee Community College	253,851	200	1,269	6,460	25	258
West Virginia Department of Education	305,828	140	217	74,133	8	9,266
West Virginia Northern College	301,440	1,589	190	237,952	44	5,408

* service costs = $\frac{\text{total treatment costs}}{\text{number of completers}}$

Section V

ISSUES IN FEDERAL PROGRAM MANAGEMENT

V. ISSUES IN FEDERAL PROGRAM MANAGEMENT

Although the Cooperative Demonstration Program (High Technology) has ended, there are important lessons to be applied to future demonstrations sponsored by OVAE and the Department. The experiences from the 27 FY1988 and FY1989 grantees visited by the study team suggest at least two groups of issues in Federal management of cooperative demonstrations:

A. Specification of the purpose of and roles in the demonstration
  - Policy-implementing versus policy-formulating demonstrations;
  - Use of evaluators;
  - Partner commitments;
  - OVAE support of grant changes;
  - Utilization of all available resources;

B. Administration of the application and grant award processes
  - Instructions to applicants;
  - Timing of the grant award; and
  - Length of the grant;

Each of these issues is discussed below. Based upon the results of this evaluation, the study team recommends alternatives for the design and administration of future demonstrations.

A. Clarifying the Demonstration Program

The Purpose of the Cooperative Demonstrations

Although titled "Cooperative Demonstration Programs," the authorizing legislation did not clearly define the term demonstration or the intent of the legislation. Instead, the legislation referred to

> programs and projects which support model programs...examples of successful cooperation between the private sector and public agencies in vocational education...programs to overcome national skill shortages...and activities such as institutional and on-the-job training, supportive services, and other such necessary assistance... (Section 411).

The legislation did not specify whether projects were to demonstrate that an intervention could be successful if it hasn't been tried before, could be improved in its original site if already in operation, could be successful in a new site if already implemented elsewhere, or some combination of these intentions. However, section 411(c)(2) did require that all funded programs be "capable of wide replication by service providers," suggesting that Congress intended the programs to demonstrate approaches that had applicability beyond just one grantee.

The program regulations also were unclear about what was to be demonstrated. The regulations specified that projects,

> must be designed to demonstrate ways in which vocational education and the private sector of the economy can work together effectively to assist vocational education students to attain the advanced level of skills needed to make the transition from school to productive employment. [CFR 112.10(a)(2)(ii)]

This broad definition allowed a wide variety of projects to be funded. Although all projects satisfied the general conditions of the regulations, it is questionable whether all projects met the intent of the regulations and the Perkins Act. For example, is a grant to a single company to retrain current employees in training programs the company would have done anyway a legitimate purpose under the program? OVAE should clearly state whether the demonstration is to field test previously identified public/private partnerships or to develop new models of such cooperation.

A key characteristic of demonstrations is that they involve "...an innovation operated at or near full-scale in a realistic environment" (Glennan, et al., 1978). Further, demonstrations can be divided into two types: policy-implementing or policy-formulating. Policy-implementing demonstrations take research ideas and put them into practice in the real world, while policy-formulating demonstrations generate new ideas and approaches based on actual field experiences (Yin and Sabol, 1991). The knowledge from policy-implementing demonstrations is focused on the experiences and outcomes from implementing ideas previously found effective under controlled research conditions. The knowledge from policy-formulating demonstrations is focused primarily on identifying ideas which can be further tested under research conditions. In both cases, demonstrations cannot be expected to establish cause-and-effect relationships because the real-life settings involve confounding events (Ginsburg, 1989).

Other Federal agencies have been more specific in their stated intent for funded demonstrations. For example, the Office for Substance Abuse Prevention, U.S. Department of Health and Human Services, stated that the purpose of one demonstration program was to:

> 1. Test the feasibility of implementing previously untested innovative prevention strategies that hold great promise for expanding our repertoire of strategies and interventions in the prevention of alcohol and other drug abuse among high-risk youth populations; or
>
> 2. Assess the program effectiveness, replicability, and generalizability of knowledge-based, established strategies for the prevention of alcohol and other drug use among high risk youth populations.

> including those derive from previous OSAP experience but not systematically evaluated.

Applicants were required to:

> Indicate whether this proposal is to (1) test the feasibility of implementing innovative prevention strategies; or (2) assess the effectiveness, replicability, and generalizability of knowledge-based, established strategies for the prevention of and/or early intervention against alcohol and other drug use among high-risk youth. If this application is proposing an innovative strategy, it is incumbent on the applicant to explain from the literature review what makes this approach innovative. If this application is designed to assess effectiveness, generalizability, and replicability of established strategies discuss what is known about the established strategies and how this application address generalizability and replicability of those strategies.

Partner Commitments

Projects funded by the Cooperative Demonstration Program were to demonstrate how public agencies in vocational education and the private sector could effectively and successfully work together. The regulations do not suggest what role the private sector should play, nor is the program designed to produce information on what roles were most effective for the private sector. This meant that each project was left to deal with developing the private sector role as it saw fit. The private sector was to be involved in the planning as well as the operation of the project (five points was awarded in the application for private-sector involvement). The role of the private sector was not well defined in the program regulations, and, as discussed in Section III, varied widely across projects. Among the FY1989 projects, the private sector was: the grantee, the referral source of students, and employer of program graduates, a source of internships, a member of the advisory group, a supplier of equipment, or a source of instructors.

The lack of specificity in the regulations and application requirements regarding private-sector involvement appears to have been problematic for several projects. Because the regulations were vague about what was acceptable private-sector involvement, applicants similarly were vague in their descriptions of how private companies would be involved in their projects. The vagueness in the applications sometimes was an indication of lack of planning on the part of the grantee. Other times it was the result of the grantee not being able to get the private partners to commit to hiring students or to activities other than advising the project.

Grantees reported problems in implementing their projects because of changes or problems in the partner's role. Some of these problems might have been avoided through additional planning in the application process. One problem was that the role of the partner was left very general during the application, and the partner was reluctant to be specific after the grant started. Some grantees overstated what the partner was to do. For others, a change of conditions made it impossible for the partner to fulfill its planned role.

The partnerships described in the applications appeared to be much stronger and more formal than those actually observed during the site visit. The statement that the applicant "has been working with Ajax Corp." for several years can mean many things. It can mean that Ajax has supplied instructors or equipment or it can mean that Ajax has hired graduates of the institution.

Partners were asked to submit letters of support for the application. However, the partner might never have seen what the applicant stated in the application and might not have been willing to provide the kind of support indicated. On the other hand the partner may have made substantial oral promises that were not committed in writing. The applicant assumed that it had a formal commitment based on the oral statement, but the partner did not feel it was a firm commitment.

The applicant should be required to have a signed document from each partner stating that the partner has read the proposal and is willing to commit to the support stated therein. After the award, and during the planning stage, the grantee should enter a formal agreement with the partner detailing precise responsibilities. Otherwise the project can be left without adequate support.

Partner support has to be clarified. Does it mean a guarantee to hire? to refer students? to provide equipment? to provide technical assistance etc.? Many grantees considered as partners the businesses that simply hired its students, even though the businesses had little involvement in the training process.

Use of Third-party Evaluators

Grantees' use of third-party evaluators was limited to verifying project activities. Although all projects had third-party evaluators, they were seldom used to measure the effectiveness of project activities or help determine the relative worth of the components of the project. Instead, grantees used the outside evaluators to confirm that activities had taken place. Most projects set aside $3,000 to $7,000 to hire a single outside person to conduct the evaluation. The evaluator observed several classes, talked to several students and faculty, and produced a report of a few pages. In a few instances the evaluator was used to assess the curriculum materials adopted by the training rather than the project itself.

The relationship between the evaluator and the project was not always unbiased. In one instance, the third-party evaluator was the same organization that had provided assistance in writing the grant application. Afterward, the evaluator provided technical assistance as well as evaluation services. The two roles had the potential of being conflicting.

Utilizing All Available Resources

Many of the projects engaged in curricula development either as a primary objective of the grant or in response to requests for specific training from a partner organization. In almost every case, the project developed the new curriculum without drawing from existing curriculum materials from other institutions, from ERIC, or from the OVAE regional curriculum coordinators. When asked why the project did not use--or at least review--the curriculum materials available elsewhere, project directors responded either that their training was unique and that materials developed elsewhere would probably not apply or that there were no materials elsewhere. A few project directors reported that they checked with other grantees, but only one reported conducting a systematic search for materials.

The failure to conduct a systematic search of other institutions and the lack of communication among the grantees resulted in some duplication of effort in curriculum development. Although some projects had unique elements, the program requirements for demonstrating successful cooperation in vocational training and for replicability suggest that the project already should be grounded in the existing literature and curriculum for the subject in their training area. With the scarcity of Federal and non-Federal resources, it is important to minimize any duplication of effort.

To reduce or eliminate duplication of effort in curriculum design, OVAE may want to require applicants to show evidence of a systematic search for curricula as part of their proposal development. If OVAE thinks such a systematic search is too burdensome during the application stage, then the search should be required as part of the initial six-month planning grant described earlier. Even if a search is conducted during application preparation, an updated search should be made during the planning grant stage to identify any new curriculum packages published during the previous 12 months.

OVAE Support of Changes by Grantees

Several projects encountered operational problems during the grant period. Problems included a deteriorating or shifting labor market, withdrawal of a key partner, or discovery that an activity was more difficult or expensive than originally estimated (e.g., producing a videodisc). In reviewing the implementation history of the project, the study team thought the problems were probably severe enough to warrant a change in project design or objectives, although such changes were made in only one case. During the site visits, the team asked project directors and staff why they didn't request a change in the grant's scope to keep up with changing conditions. Almost all said that they thought they had to fulfill the terms of the grant application and that any requests for changes would be considered a sign of failure or simply not approved. This misperception on the part of project staff resulted in the project continuing on an inappropriate--and ultimately unsuccessful--path.

There were several reasons why the OVAE program managers might have been unaware of all the implementation problems encountered by grantees. First, not all projects submitted the required quarterly progress reports, and those that did often did not include a complete discussion of any problems being encountered. Second, even during the periodic telephone calls by program managers to the project, project directors might have been reluctant to share the true extent of their problems because of a decision by the grantee to "put the best face forward." Third, the evidence to justify a change might not have been conclusive at the time of the problem, and project staff were optimistic that they could still correct the problem later in the grant period. Finally, the large number of grants (30 to 35) that had to be monitored by each Federal program manager plus the additional workload of reviewing new applications and drafting revisions to program regulations meant there was little time to do more than cursory study of the grantees' reported activities.

OVAE may want to consider two solutions to the problem of grantees not divulging serious implementation problems. First, OVAE program managers should discuss potential implementation problems with grantees at their kick-off meeting in Washington, D.C. The discussion should include both the nature of the problems encountered by other demonstrations (not just the Cooperative Demonstration Program) and the conditions under which it is important and acceptable to request changes in the scope of the grant. Second, program managers should use the monitoring telephone calls to discuss both the accomplishments of the project and the problems (potential or actual) preventing expected accomplishments. If project directors are open about the problems they encounter, then the program manager will be better able to suggest solutions or put the project director in touch with other grantees having similar problems. This more open, communication however, will require program managers to become more active in the internal operations of the project.

B. Administering the Application and Grant Award Processes

Instructions to Applicants

The initial instructions to applicants are important for conveying information about program priorities. The instructions also can be useful in ensuring that applicants give sufficient forethought to their projects and avoid problems during implementation. The OVAE program staff has a certain amount of discretion in terms of the amount of information it provides in the application and the manner in which it is presented.

Instructions to applicants can be more specific than those currently in effect. The study team examined similar regulations for demonstrations in both the U.S. Department of Labor (DOL) and the U.S. Department of Health and Human Services (DHHS). The instructions issued by the Office for Substance Abuse Prevention (OSAP) in DHHS offers an interesting model. Overall, the OSAP instructions are much more comprehensive and give a better understanding of how an applicant should respond to the grant announcement. As described earlier, the OSAP grant announcement provides a clear definition of what a logic model is and a sample outline for conceptualizing and developing a demonstration grant using the components of a logic model.

One of the OSAP grants announcement's major components is evaluation. The Anti-Drug Abuse Act of 1988 stipulates that priority should be given to demonstrations that employ appropriate strategies for evaluating the effectiveness of their proposed project. OSAP will only support projects with a "well-developed" evaluation plan. All evaluation plans are expected to include both process and outcome evaluations:

> Process evaluation is a quantitative and qualititative description of the intervention, target population, and staff of a project from inception. Process evaluation should clearly and comprehensively document the relationship of the resources and program activities to the project objectives so as to permit mid-project adjustments as needed to optimize project implementation and ultimate replication. The

evaluation plan should include a description as to how the components of a process evaluation have been or will be obtained/collected and maintained. The following are components of a process evaluation:

1. Problem: the process by which the problem was defined as to (a) what is being demonstrated, (b) selection of risk factors to be addressed, (c) analysis of process by which population becomes at risk;
2. Target Population: including demographic and other relevant characteristics, case finding and retention strategies;
3. Goals and Objectives of the Project to be Evaluated: the process by which the goals and objectives of the project to be evaluated were selected;
4. Staffing Patterns: staff characteristics and qualifications including that of project director; supervision patterns; staff selection processes; staff activities and work schedule;
5. Referral and Case Finding Patterns (if applicable): number, type, characteristics of referrals to and from project; participating agencies in project including the development of inter-organizational linkages with these agencies;
6. Intervention: frequency, duration, type of contract; client flow, intervention materials, manuals, staff training; staff and client perceptions of the interventions and objectives of the project;
7. Cost Data: funding sources, cost per service, cost per client;
8. Evaluation Procedures: monitoring instruments, need and risk assessment instruments; feedback mechanisms to director, staff, community representatives; and
9. Generalizability of Program Findings for Program Dissemination: Manuals and/or curricula that will be produced.

> Outcome Evaluation: The evaluation plan should be detailed and clearly articulated. It should present an evaluation design appropriate to the project and of sufficient rigor to permit drawing valid conclusions concerning the effectiveness of the various intervention strategies. Outcomes variables should be derived from the logic model.

At least one grant demonstration program requires applicants to describe in detail the projected performance indicators for the project. The U.S. Department of Labor's "Disabled Program" requires advanced estimates of performance indicators similar to those used in the cost benefit portion of this evaluation:

- Placements. Indicate the number of trainees who will be trained and placed in unsubsidized employment upon completion of the services provided (which cannot be less than 100);

- Average Cost Per Entered Employment. In relation to the total Federal costs proposed, indicate the expected average cost for each trainee who will be trained and placed into unsubsidized employment;

- Average Hourly Wage. Indicate the expected hourly wage that will be received by trainees upon completion of the program; and

- Projected Performance Indicators shall be provided on a quarterly basis and for each project site (Announcement SCA/DAA-92-001).

Timing of the Grant Award

The timing of the notification of the grant award and the starting date for the award have important implications for project implementation. Most academic institutions plan their staffing and activities according to the academic-year calendar, i.e., the academic year starts in the fall and ends in late spring or early summer. The institution may offer summer activities, but these are secondary to those conducted during the regular school year. Academic institutions plan in the spring for the following year and try to have both activity schedule and staff assignments settled by May or June preceding the September start.

Projects that start at the beginning of the academic year seem to be easier to implement than those starting mid-year. The FY1989 grantees were notified of their awards in October 1989 and most negotiated award starting dates of January 1, 1990. (Two projects delayed their date until July 1990 because of existing Cooperative Demonstration grants that were still in progress.) The difficulty with a January start is that all available grantee staff are already assigned to other projects, are in the midst of those assignments, and are reluctant to shift to a new assignment. If the project goes outside the grantee to hire project staff, there are fewer qualified staff available.

If new staff are hired, or even experienced staff reassigned, the planning for the project is taking place after other institutional events and programs have been established. Therefore, staff and other resources may not be available for use by the project as proposed. It might help the project to align the start of training activities with the start of the school year.

The main exception to scheduling project start-up for the beginning of academic year is curriculum development projects that require significant amounts of instructor time. In this type of project, the start of the curriculum development phase should coincide with summer vacations when schools are out and teaching loads are light. In the summer, instructors have more time, are better able to concentrate, and will be able to integrate their new curriculum with their lesson plans for the next year.

Although grantees have two to three months advanced notice of the grant start by virtue of entering into negotiations with the Department, grantees often do not start planning or hiring until the grant award officially starts. Several grantees commented that they know of funding (Federal or State) that was canceled just before the award was made, and so the grantees no longer initiate work based on verbal agreements. Grantees wait until the grant has officially started before they began to look for staff, rent space, assemble equipment, or negotiate contractual agreements with partners. For example, if a grant award is made on September 30th for a project start date of December 1st, the grantee will wait until December 1st to begin any activities.

Length of the Grant

The time period for the grant also has important implications for the activities that can be carried out and the ability to draw conclusions about outcomes from the grant. The time period for the Cooperative Demonstration grants was 18 months, with some projects requesting three- or six-month extensions. For grantees with no existing staff or training activities to assign to the project, between three and six months of the grant period had to be devoted to hiring staff, establishing office and contracting procedures, and planning training. For grantees with existing staff or similar training activities already in place, startup costs were not as high but the training offered was often more extensive (part of at least a two year training program).

Most grantees agreed that 18 months was not enough time to accomplish anything other than customized training. A more workable arrangement would dissaggregate the grant into two separate--but related--grants totaling 24 months. The first grant would be a six-month planning grant during which the grantee could update the labor market information on which the training is justified.

There can be as many as 18 months from the time the labor market information is collected and the award starts. During that time, local market conditions can change dramatically. Business can shut down, new employers move into the area, competing programs start, or the technology of the field can change. The planning grant also would allow the grantee time to hire the staff necessary to run the project. The advertising, interviewing, hiring, and orientation can take as long as four months. Once project staff have been hired, they will require an additional two months to establish routine office procedures.

Finally, the planning grant allows time for the grantee to negotiate specific roles and responsibilities with the private partner. If the proposed private partner is unable to fulfill commitments made during the application process, the planning grant then gives the grantee time to find an alternative partner(s).

The second grant would fund actual training or other proposed activities for 18 months. Because grantees currently find it difficult to attract project staff if there is no certainty of long-term employment, the operating grant would have to be virtually guaranteed unless their plans were not adequately developed. However, the certainty of 24 months of funding must be balanced against the need for projects to demonstrate appropriate and efficient planning at the end of the planning grant. The OVAE program managers (and perhaps the original review panels) would be required to review and approve the operating plans before the second grant could be released.

Section VI

FINDINGS AND RECOMMENDATIONS

VI. FINDINGS AND RECOMMENDATIONS

This section summarizes the major findings from sections II, III, and IV, and answers the three evaluation questions framing the study.

A. Did the Grant Applications Present a Clear and Coherent Design for a Project?

- Of the 23 FY1988 applications reviewed, three were judged high in the likelihood of being successful (being both logical and plausible), ten were judged as moderately likely, and ten were judged less likely. The quality of the awarded applications improved in the second year. Of the 30 FY1989 applications reviewed, nine were judged high in the likelihood of being successful (being both logical and plausible), 16 were judged as moderately likely, and five were judged less likely.
- Key terms in the application package and program regulations were not operationally defined, resulting in wide disparities across projects.
- Applications frequently did not state clearly what was to be demonstrated.

Based on these findings and other information collected during the evaluation, the study team recommends that:

1. Program regulations should be more precisely worded to convey a clear meaning of key terms such as "demonstration" and "high-technology";
2. Applicants should be instructed to clearly show the logic and plausibility of their project designs;
3. If logic and plausibility are important to the Department, they should be assigned points in the evaluation criteria (much

like the points assigned for organization capacity); and

4. The panel reviewing the applications should include experts familiar with the high technology field or activities being proposed. Such experts could identify activities which are not feasible within the time frame or resources proposed. A bank of experts can be identified and tentatively invited prior to the receipt of the applications, and those with direct expertise can be appointed to the panels once the technical areas have been identified.

B. Were the Project Designs Successfully Implemented?

- FY1988 grantees were generally surprised that they were funded and were not prepared for the immediate start of the project. FY1989 grantees were less surprised because of better monitoring of the award process (and several were FY1988 grantees).

- Grantees who were already operating similar projects were able to implement their projects faster and more successfully than projects starting from scratch. The availability of existing partnerships, staff, and institutional support was a key factor in the project's success.

- Local labor market conditions significantly worsened after the time the applications were submitted and made it difficult to implement the proposed internship, job placement, and recruiting components. It appears that applicants may not have fully disclosed or understood local economic conditions in their application.

- Grantees who had no prior working relationship with the proposed partner(s) had difficulty getting cooperation or support from that partner(s). The problems in obtaining cooperation from the partner organization were exacerbated by local labor market conditions.

- Projects with larger numbers of private partners used those partners in less intensive ways, while projects with fewer partners used them more intensively. Projects with fewer, more involved partners tended to be more successful.

- Grantees targeting hard-to-serve populations tended to shift their focus to less challenging students once they realized the difficulty of what had been proposed. A few projects added enhanced basic skills training for the hard-to-serve students they did recruit. Several projects were unrealistic in their expectations of clients or their assumptions about the needs of employers.

- Projects providing customized job training were more successful in training the proposed numbers of students than were other types of projects. In some projects, however, the customized training subsidized training the partner would have done even without the project.

- The training provided by most projects was of short duration. Except for a few multi-year training efforts (of which the grant funded only a portion, most students received fewer than 100 hours of training. The short duration of training reflects the fact that most programs involved some type of customized training, which in turn reflects the 18-month time frame of the grant.

- Staffing shortages in OVAE resulted in grantees receiving less technical assistance and guidance from project officers than initially planned.

- Most of the third party evaluations of projects produced little feedback to grantees and limited outcome information at the end of the project.

- Very few of the projects involved students in secondary schools. It was not possible to determine whether the low representation was due to lack of interest or awareness by secondary schools or whether it was a result of the grant review process. The low involvement of secondary schools resulted in few lessons about public private cooperation at this level.

Based on these findings and other information collected during the evaluation, the study team recommends that:

1. Grant awards should be made in the spring for project starts in the summer because of the greater availability of grantee staff, reduced training demands by other programs, and more opportunities for planning.

2. The applicant's justification of labor needs should address the geographic area immediately surrounding (i.e., within reasonable commuting distance for the students' being trained) and use current labor market data.

3. Applicants should state in detail the role and responsibilities of the private partner(s) and include a statement from the partner agreeing to accept this role. Applicants should be encouraged to pursue only a few partners but have those partners much more heavily involved.

4. Grantees should be encouraged to request changes to the scope of work in response to changes in the local labor market and other conditions. Some grantees made extensive ad hoc changes in the project design while others felt they were not allowed to deviate from the application.

5. The Department should consider awarding a six month planning grant combined with an 18- to 24-month implementation grant.

6. Grantees should be held more accountable for meeting the objectives stated in their application or revised scope. Objectives should be stated in operational terms that can be measured by the third party evaluator.

7. OVAE staff should hold additional meetings of all project directors as a group. These meetings should address management, evaluation, and reporting issues. OVAE may want to consider a program for on-going technical assistance to grantees, much the way other Federal agencies do.

8. The Department should formulate procedures for ensuring greater participation by secondary schools.

C. Are Project Costs Reasonable in Relation to Project Outcomes?

- Planning and administrative costs accounted for between two percent and 35 percent of total project costs, with most projects averaging 35 percent.
- The cost per student trained and per hour of training was similar across projects.
- Project costs were greatly affected by the monetary value assigned to the equipment and other contributions from private partners, with no assurance of standard values across projects.

Based on these findings and other information collected during the evaluation, the study team recommends that:

1. Applicants should better substantiate the value assigned to in-kind contributions.
2. The contributions from the private sector should be clearly distinguished from contributions from the grantee institution.
3. Grantees should be held to the same non-supplanting requirements of other Perkins Act programs.
4. Applicants should be told at the start of the grant what cost and performance data they will be expected to provide at the end of the grant.

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Appendix A-1

PUBLIC LAW 98-524 ESTABLISHING THE COOPERATIVE DEMONSTRATION PROGRAM

"PART B—DEMONSTRATION PROGRAMS

"Subpart 1—Cooperative Demonstration Programs

"PROGRAM AUTHORIZED

Grants.
Contracts with U.S.
20 USC 2411.
Post, p. 2479.

"SEC. 411. (a) From the amounts available for this part under section 451 for each fiscal year, the Secretary is authorized to carry out, directly or through grants to or contracts with State and local educational agencies, postsecondary educational institutions, institutions of higher education, and other public and private agencies, organizations, and institutions, programs and projects which support—

Ante, p. 2450.

"(1) model programs providing improved access to quality vocational education programs for those individuals described in section 201(b) of this Act and for men and women seeking nontraditional occupations;

"(2) examples of successful cooperation between the private sector and public agencies in vocational education, involving employers or consortia of employers or labor organizations and building trade councils, and State boards or eligible recipients designed to demonstrate ways in which vocational education and the private sector of the economy can work together effectively to assist vocational education students to attain the advanced level of skills needed to make the transition from school to productive employment, including—

"(A) work experience and apprenticeship programs;

"(B) transitional worksite job training for vocational education students which is related to their occupational goals and closely linked to classroom and laboratory instruction provided by an eligible recipient;

"(C) placement services in occupations which the students are preparing to enter; and

"(D) where practical, projects (such as the rehabilitation of public schools or housing in inner cities or economically depressed rural areas) that will benefit the public;

"(3) programs to overcome national skill shortages, as designated by the Secretary in cooperation with the Secretary of Labor, Secretary of Defense, and Secretary of Commerce; and

"(4) such other activities which the Secretary may designate which are related to the purposes of this Act.

"(b)(1) Projects described in clause (2) of subsection (a) may include institutional and on-the-job training, supportive services authorized by this Act, and such other necessary assistance as the Secretary determines to be necessary for the successful completion of the project.

"(2) Not less than 25 percent of the cost of the demonstration programs authorized by this subpart shall be provided by the recipient of the grant or contract, and such share may be in the form of cash or in-kind contributions, including facilities, overhead, personnel, and equipment fairly valued.

"(c) All programs assisted under this section shall be—

"(1) of direct service to individuals enrolled in such programs; and

"(2) capable of wide replication by service providers.

Public availability.

"(d) The Secretary shall disseminate the results of the programs and projects assisted under this section in a manner designed to improve the training of teachers, other instructional personnel, counsellors, and administrators who are needed to carry out the purposes of this Act.

"(e) Not later than one year after the date of enactment of the Carl D. Perkins Vocational Education Act, the Secretary of Labor and the Secretary of Education shall develop and implement a plan for greater coordination between vocational education programs and apprenticeship training programs. Linkages between such programs shall be established relating to apprentice-school programs, and preapprenticeship programs, and program evaluation and performance standards (particularly with respect to apprenticeship training and programs of related instruction). The Secretaries shall establish such other collaborative and cooperative efforts as are considered feasible and appropriate.

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Appendix A-2

34 CFR CH. IV SECTION 412 REGULATIONS GOVERNING THE COOPERATIVE DEMONSTRATION PROGRAM

PART 412—COOPERATIVE DEMONSTRATION PROGRAM

Subpart A—General

Sec.
412.1 What is the Cooperative Demonstration Program?
412.2 Who is eligible to apply for an award under this program?
412.3 What regulations apply to this program?
412.4 What definitions apply to this program?

Subpart B—What Kinds of Activities Does the Secretary Assist Under This Program?

412.10 What types of projects may be funded?
412.11 How does the Secretary establish priorities for this program?

Subpart C—[Reserved]

Subpart D—How Does the Secretary Make a Grant?

412.30 How does the Secretary evaluate an application?
412.31 What selection criteria does the Secretary use?

Subpart E—What Conditions Must Be Met by a Recipient?

412.40 What cost sharing requirement is imposed under this program?

AUTHORITY: Sec. 411 of the Carl D. Perkins Vocational Education Act, 20 U.S.C. 2411, as enacted by Pub. L. 98-524, unless otherwise noted.

SOURCE: 50 FR 33260, Aug. 16, 1985, unless otherwise noted.

Subpart A—General

§ 412.1 What is the Cooperative Demonstration Program?

(a) The Cooperative Demonstration Program provides financial assistance for—

(1) Model projects providing improved access to quality vocational education programs for certain individuals;

(2) Projects that are examples of successful cooperation between the private sector and public agencies in vocational education;

(3) Projects to overcome national skill shortages; and

(4) Other activities which the Secretary may designate that are related to the purpose of the Act.

(b) Projects eligible for assistance are described in § 412.10

(Authority: Sec. 411(a); 20 U.S.C. 2411(a))

§ 412.2 Who is eligible to apply for an award under this program?

The following are eligible to apply for an award under this program:

(a) State educational agencies (SEAs).

(b) Local educational agencies (LEAs).

(c) Postsecondary educational institutions.

(d) Institutions of higher education.

(e) Other public and private agencies, organizations, and institutions.

(Authority: Sec. 411(a); 20 U.S.C. 2411(a))

§ 412.3 What regulations apply to this program?

The following regulations apply to the Cooperative Demonstration Program:

(a) The regulations in 34 CFR Part 400.

(b) The regulations in this part.

(Authority: Sec. 411; 20 U.S.C. 2411)

§ 412.4 What definitions apply to this program?

The definitions in 34 CFR 400.4 apply to the Cooperative Demonstration Program.

(Authority: Sec. 411; 20 U.S.C. 2411)

Subpart B—What Kinds of Activities Does the Secretary Assist Under This Program?

§ 412.10 What types of projects may be funded?

(a) The Secretary may support directly or through grants, cooperative agreements, or contracts the following types of projects:

(1) Model projects providing improved access to quality vocational education programs for—

(i) Handicapped individuals;

(ii) Disadvantaged individuals;

(iii) Adults who are in need of training and retraining;

(iv) Individuals who are single parents or homemakers;

(v) Individuals who participate in programs designed to eliminate sex bias and stereotyping in vocational education;

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(vi) Criminal offenders who are serving in a correctional institution; and

(vii) Men and women seeking nontraditional occupations.

(2)(i) Projects that are examples of successful cooperation between the private sector (including employers, consortia of employers, labor organizations, and building trade councils) and public agencies in vocational education, including State boards and eligible recipients.

(ii) The projects described in paragraph (a)(2)(i) of this section must be designed to demonstrate ways in which vocational education and the private sector of the economy can work together effectively to assist vocational education students to attain the advanced level of skills needed to make the transition from school to productive employment, including—

(A) Work experience and apprenticeship projects;

(B) Transitional worksite job training for vocational education students which is related to their occupational goals and closely linked to classroom and laboratory instruction provided by an eligible recipient;

(C) Placement services in occupations which the students are preparing to enter; and

(D) Where practical, projects that will benefit the public, such as the rehabilitation of public schools or housing in inner cities or economically depressed rural areas.

(iii) The projects described in paragraphs (a)(2) (i) and (ii) of this section may include institutional and on-the-job training, support services authorized by the Act, and such other necessary assistance as the Secretary determines to be necessary for the successful completion of the project.

(3) Projects to overcome national skill shortages, as designated by the Secretary in cooperation with the Secretary of Labor, Secretary of Defense, and Secretary of Commerce.

(4) Such other activities which the Secretary may designate which are related to the purposes of the Act.

(b) All projects assisted under the Cooperative Demonstration Program must be—

(1) Of direct service to the individuals enrolled; and

(2) Capable of wide replication by service providers.

(Authority: Sec. 411 (a), (b), (c); 20 U.S.C. 2411 (a), (b), (c))

§ 412.11 How does the Secretary establish priorities for this program?

(a) The Secretary may announce through one or more notices published in the FEDERAL REGISTER the priorities for this program (including any national skill shortages to be addressed) if any, from the types of projects described in § 412.10.

(b) The Secretary may establish a separate competition for one or more of the priorities selected. If a separate competition is established for one or more priorities, the Secretary may reserve all applications that relate to those priorities for review as part of the separate competition.

(Authority: Sec. 411; 20 U.S.C. 2411)

Subpart C—[Reserved]

Subpart D—How Does the Secretary Make a Grant?

§ 412.30 How does the Secretary evaluate an application?

(a) The Secretary evaluates an application for a grant or cooperative agreement on the basis of the criteria in § 412.31.

(b) The Secretary may award up to 100 points, including a reserved 15 points to be distributed in accordance with paragraph (d) of this section, based on the criteria in § 412.31.

(c) Subject to paragraph (d) of this section, the maximum possible points for each criterion is indicated in parentheses after the heading for each criterion.

(d) For each competition, as announced in a notice published in the FEDERAL REGISTER, the Secretary may assign the reserved 15 points among the criteria in § 412.31.

(Authority: Sec. 411; 20 U.S.C. 2411)

(Approved by the Office of Management and Budget under control number 1830-0013)

§ 412.31 What selection criteria does the Secretary use?

The Secretary uses the following selection criteria in evaluating each application:

(a) *Need.* (15 points)

(1) The Secretary reviews each application for information that shows the need for and the soundness of the rationale for the project.

(2) The Secretary looks for information that shows—

(i) A clear description of the need for the proposed project;

(ii) Specific evidence of the need for the project;

(iii) A description of any ongoing and planned activities in the community relative to the need, including, if appropriate, the relationship of any local, regional or State economic development plan;

(iv) Evidence that demonstrates the vocational training to be provided is designed to meet current and projected occupational needs;

(v) A clear statement of what the project seeks to demonstrate; and

(vi) Evidence that the project is likely to serve as a model in the future.

(b) *Plan of operation.* (20 points)

(1) The Secretary reviews each application for information that shows the quality of the plan of operation for the project.

(2) The Secretary looks for information that shows—

(i) High quality in the design of the project;

(ii) An effective plan of management that ensures proper and efficient administration of the project;

(iii) A clear description of how the objectives of the project relate to the purpose of the program;

(iv) The way the applicant plans to use its resources and personnel to achieve each objective; and

(v) A clear description of how the applicant will provide equal access and treatment for eligible project participants who are members of groups that have been traditionally underrepresented, such as—

(A) Members of racial or ethnic minority groups;

(B) Women;

(C) Handicapped persons; and

(D) The elderly.

(c) *Quality of key personnel.* (10 points)

(1) The Secretary reviews each application for information that shows the qualifications of the key personnel the applicant plans to use on the project.

(2) The Secretary looks for information that shows—

(i) The qualifications of the project director (if one is to be used);

(ii) The qualifications of each of the other key personnel to be used in the project;

(iii) The time that each person referred to in paragraphs (c)(2) (i) and (ii) of this section will commit to the project; and

(iv) The extent to which the applicant, as part of its nondiscriminatory employment practices, encourages applications for employment from persons who are members of groups that have been traditionally underrepresented, such as—

(A) Members of racial or ethnic minority groups;

(B) Women;

(C) Handicapped persons; and

(D) The elderly.

(3) To determine personnel qualifications, the Secretary considers experience and training, in fields related to the objectives of the project, as well as other information that the applicant provides.

(d) *Budget and cost effectiveness.* (10 points)

(1) The Secretary reviews each application for information that shows the project has an adequate budget and is cost effective.

(2) The Secretary looks for information that shows—

(i) The budget for the project is adequate to support the project activities; and

(ii) Costs are reasonable in relation to the objectives of the project.

(e) *Evaluation plan.* (5 points)

(1) The Secretary reviews each application for information that shows the quality of the evaluation plan for the project.

CROSS-REFERENCE. See 34 CFR 75.590 (Evaluation by the grantee).

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(2) The Secretary looks for information that shows methods of evaluation that are appropriate for the project and, to the extent possible, are objective and produce data that are quantifiable.

(f) *Adequacy of resources.* (5 points)

(1) The Secretary reviews each application for information that shows that the applicant plans to devote adequate resources to the project.

(2) The Secretary looks for information that shows—

(i) The facilities that the applicant plans to use are adequate; and

(ii) The equipment and supplies that the applicant plans to use are adequate.

(g) *Private sector involvement.* (5 points)

(1) The Secretary reviews each application for information that shows the involvement of the private sector.

(2) The Secretary looks for information that shows—

(i) Private sector involvement in the planning of the project; and

(ii) Private sector involvement in the operation of the project.

(h) *Employment opportunities.* (5 points)

The Secretary looks for information and documentation of the extent to which trainees will be employed in jobs related to their training upon completion of their training.

(i) *Dissemination.* (10 points)

(1) The Secretary reviews each application for information that shows that the applicant has an effective and efficient plan for disseminating information about the demonstration project, including the results of the project and any specialized materials developed by the project.

(2) The Secretary looks for information that shows—

(i) High quality in the design of the dissemination plan and procedures for evaluating the effectiveness of the dissemination plan;

(ii) A description of the types of materials the applicant plans to make available and the methods for making the materials available;

(iii) Provisions for demonstrating the methods and techniques used by the project;

(iv) Provisions for assisting others to adopt and successfully implement the project or methods and techniques used by the project; and

(v) Provisions for publicizing the findings of the project at the local, State, or national level.

(Authority: Sec. 411; 20 U.S.C. 2411)

(Approved by the Office of Management and Budget under control number 1830-0013)

Subpart E—What Conditions Must Be Met by a Recipient?

§ 412.10 What cost sharing requirement is imposed under this program?

(a) A recipient shall provide not less than 25 percent of the cost of the demonstration project it conducts under this program.

(b) In accordance with Subpart G of 34 CFR Part 74, the non-Federal share may be in the form of cash or in-kind contributions, including the fair market value of facilities, overhead, personnel, and equipment.

Appendix B-1

FY1988 GRANTEES REVIEWED IN THE EVALUATION

FY1988 GRANTEES REVIEWED IN THE EVALUATION

Grantee	Project
Central Community College-Platte Campus	Competency-Based Modular Assessment and Training for Maintenance Technicians in Manufacturing
Division of Vocational Education Services State Department of Education Montgomery, Alabama	Student Apprenticeship Linkage in Vocational Education
El Paso Community College El Paso, Texas	CAREER Program: Career Assessment, Remediation, Education, Employment, and Re-entry
Francis Tuttle Vocational* Technical Center Oklahoma City, Oklahoma	High Technology Partnership Project
Greenville Technical College Greenville, South Carolina	Project TEAM: Technical Education Advancement Modules
Hampden County Employment and Training Consortium Springfield, Massachusetts	Project CREATE: Cooperative Resources to Enhance Access to Jobs Through Technical Education
Indian Hills Community College Ottumwa, Iowa	Indian Hills Cooperative Demonstration Program
Indiana University of Pennsylvania*● Reschini House Indiana, Pennsylvania	Northwestern Pennsylvania Cooperative Demonstration for Technical Updating

*responded to telephone survey
●received site visit

Northampton Community College*● Bethlehem, Pennsylvania	Turn-key Surface Mount Training Program
Parkland College Champaign, Illinois	Advanced Certification Program for Computer Graphic Specialists
Portland Community College Portland, Oregon	Women in Education for Apprenticeship and Non-Traditional Employment
Postsecondary Vocational-Technical Education Concord, New Hampshire	New Hampshire Automotive Education Collaborative
Richland School District*● Kennewick, Washington	Materials Technology: The Common Core Skills That Are Shaping the Future
Skyline College*● San Bruno, California	Toyota/Skyline Partnership for Automotive Technician Training
Southern Growth Policies Board Research Triangle Park, North Carolina	Consortium for Manufacturing Competitiveness
Toledo Public Schools Toledo, Ohio	Industrial Automation Mechanic Model Curriculum
University of North Dakota-Lake Region Devils Lake, North Dakota	Flight Simulator Maintenance Technician
University of Wisconsin-Stout*● Menomonie, Wisconsin	Implementing a High-Tech Training Model for Rural Based Business and Industry, Technical Colleges, and Local and State Education Agencies

*responded to telephone survey
●received site visit

Valencia Community College*● Orlando, Florida	A Model, Replicable Advanced Manufacturing Demonstration Project
Valencia Community College*● Orlando, Florida	Film Production Technology Training Program
Ventura Community College District*● Moorpark College Moorpark, California	Non-college Bound Student Demonstration Project - Electronics /Laser/Electro-optics
Waubonsee Community College Sugar Grove, Illinois	A Comprehensive Development Plan in Office Skills
Yakima Valley Community College Yakima, Washington	Extending Health Training and Services to Rurally Isolated Populations in a Depressed Area

*responded to telephone survey
●received site visit

Appendix B-2

FY1989 GRANTEES REVIEWED IN THE EVALUATION

FY1989 GRANTEES REVIEWED IN THE EVALUATION

Grantee	Project
Bronx Community College*● Bronx, New York	A Model Program Demonstrating A Public/Private Sector Cooperative Training Program in Radiologic Technology
Center for Occupational Research and Development (CORD)*● Waco, Texas	Semiconductor Manufacturing Technology Program
Clackamas Community College*● Oregon City, Oregon	Precision Manufacturing Technology Project
Fox Valley Technical College Appleton, Wisconsin	A "Systems" Approach to Providing Cost-Effective Training and Tehnical Assistance in CIM to Small Manufacturers
Hampden County Employment and Training Consortium*● Springfield, Massachusetts	Project: High-Tech '90
Home Builders Institute*● Washington, D.C.	Training and Certification Program for Smart House Installer/Technicians
Howard Community College*● Columbia, Maryland	Enhanced Re-entry Nurses's Education Using Interactive Videodisc Assessment/Instruction
Indian Hills College Ottumwa, Iowa	A Model to Provide Degree-bearing Training to Non-traditional Students

*respond to mail survey
●received site visit

Illinois Eastern Community College*● Olney, Illinois	Training in Semiconductor Technology
LTV Steel Company Whiting, Indiana	Electronic and Instrument Repair Technician Apprenticeship
Luzerne County Community College*●	Advanced Technology Center Computerized Numeric Control
Nanticoke, Pennsylvania	Cooperative Demonstration Training Program
Nebraska Department of Labor*● Lincoln, Nebraska	Rural Allied Medical Business Occupations Program
North Clackamas School*● District #12 Milwaukee, Oregon	Student Cooperative Training Units Program
Partners for American Vocational Education (PAVE)*● Alexandria, Virginia	Business-Education Venture for Health Care Occupations Training
Southwestern Community*● College Chula Vista, California	Comprehensive Aerospace Manufacturing Technology Program
State Center Community*● College District Fresno, California	Advanced Technology Center
Waubonsee Community College*● Sugar Grove, Illinois	Survival Skills for Office Technicians

*respond to mail survey
●received site visit

West Virginia Department of Education*● Charleston, West Virginia	Cooperative Demonstration of High Technology Programs in Computer Language and Health Occupations
West Virginia Northern Community College*● Wheeling, West Virginia	High Technology Training: The Other Half of the Equation

*respond to mail survey
●received site visit

Appendix C-1

RAW SCORES OF PROJECT LOGIC FOR FY1989 PROJECTS

Appendix C-1

RAW SCORES OF PROJECT LOGIC FOR FY1989 PROJECTS

Grantee	Number of Inputs	Number of Activities	Number of Short-term Outcomes	Number of Long-term Outcomes	Number of Short-Term Linkages			Number of Long-Term Linkages		
					Support	No Support	Total	Support	No Support	Total
Alabama Aviation College	3	4	8	4	+1	-7	-6	0	-4	-4
Ben Hill-Irwin Institute	4	7	7	4	+5	-2	+3	0	-4	-4
Bronx Community College	4	5	8	3	+5	-3	+2	0	-3	-3
Chattanooga State College	3	4	13	4	+6	-7	-1	+1	-3	-2
Clackamas Community College	4	6	14	5	+14	0	+14	+2	-3	-1
Columbia Basin College	4	5	14	4	+14	0	+14	+1	-3	-2
CORD	4	8	15	4	+13	-2	+11	+3	-1	+2
El Paso Community College	3	4	8	2	+8	0	+8	0	-2	-2
Fox Valley Tech	3	3	6	3	+6	0	+6	0	-3	-3
Hampden County Consortium	4	6	13	4	+13	0	+13	0	-4	-4
Home Builders Institute	3	4	10	5	+8	-2	+6	+4	-1	+3
Howard Community College	3	6	14	4	+4	-9	-5	0	-4	-4
Illinois Central College	4	6	8	4	+8	0	+8	+1	-3	-2
Illinois Eastern College	4	5	10	4	+10	0	+10	0	-4	-4
Indian Hills College	3	5	7	4	0	-7	-7	0	-4	-4
John M. Patterson College	4	8	16	3	+16	0	+16	0	-3	-3

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Appendix C-1, (Continued)

					Number of Short-Term Linkages			Number of Long-Term Linkages		
Grantee	Number of Inputs	Number of Activities	Number of Short-term Outcomes	Number of Long-term Outcomes	Support	No Support	Total	Support	No Support	Total
LTV Steel Co.	3	6	14	1	+4	-10	-6	0	-1	-1
Luzerne Community College	3	8	15	4	+16	0	+16	+2	-2	0
Nebraska Labor Department	3	8	7	4	+6	-1	+5	0	-4	-4
Northampton Community College	4	6	10	5	+10	0	+10	0	-5	-5
North Clackamas Schools	3	6	15	4	+13	-2	+11	0	-4	-4
PAVE	3	12	22	3	+22	0	+22	0	-3	-3
Southwestern College District	5	5	10	3	+10	0	+10	0	-3	-3
State Center College District	4	10	20	5	+18	-2	+16	0	-5	-5
Valencia Community College (CIM)	4	6	8	7	+6	-2	+4	+1	-6	-5
Valencia Community College (Health)	4	3	12	5	+13	0	+13	+1	-4	-3
Valencia Community College (Tele)	5	10	10	7	+5	-5	0	+3	-4	-1
Waubonsee Community College	3	8	14	3	+4	-6	-2	0	-3	-3
West Virginia Department of Education	4	3	8	4	+6	-2	+4	0	-4	-4
West Virginia Northern College	4	6	8	5	+5	0	+5	+1	-4	-3

Appendix C-2

RAW SCORES OF PROJECT PLAUSIBILITY FOR FY1989 PROJECTS

Appendix C-2

RAW SCORES OF PROJECT PLAUSIBILITY FOR FY1989 PROJECTS

Project	Sufficient Resources		Sufficient Time for Activities		Sufficient Time for Short-Term Outcomes		Access to Training	Public/Private Partnership
Alabama Aviation College	+3	-1	+4	0	+6	-2	+	+
Ben Hill-Irwin Institute	+6	-1	+7	0	+6	-1	–	+
Bronx Community College	+5	0	+4	-1	+7	-1	+	+
Chattanooga State College	+3	-1	+4	0	+11	-2	–	+
Clackamas Community College	+5	-2	+6	-1	+14	0	+	+
Columbia Basin College	+3	-2	+8	0	+13	-1	–	+
CORD	+5	-3	+8	0	+14	-1	+	+
El Paso Community College	+2	-2	+4	0	+6	-2	+	+
Fox Valley Tech	+3	-1	+3	-1	+6	0	–	+
Hampden County Consortium	+5	-1	+6	0	+11	-2	+	+
Home Builders Institute	+4	0	+4	0	+8	-2	–	+
Howard Community College	+3	-3	+4	-2	+11	-3	+	+
Illinois Central College	+6	0	+6	0	+8	0	+	+
Illinois Eastern College	+4	-1	+5	0	+10	0	–	+
Indian Hills Community College	+4	-1	+5	0	+7	0	+	+
John M. Patterson College	+4	-4	+7	-1	+13	-3	+	+

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Appendix C-2, (Continued)

Project	Sufficient Resources		Sufficient Time for Activities		Sufficient Time for Short-Term Outcomes		Access to Training	Public/Private Partnership
LTV Steel Co.	+2	-4	+6	0	+12	-2	+	+
Luzerne Community College	+5	-3	+8	0	+12	-2	+	+
Nebraska Labor Department	+8	0	+8	0	+6	-1	+	+
Northampton Community College	+4	-2	+3	-3	+6	-4	+	+
North Clackamas Schools	+5	-1	+4	-2	+13	-2	–	+
PAVE	+3	-9	+9	-3	+22	0	+	+
Southwestern College District	+3	-2	+5	0	+8	-2	+	+
State Center College District	+3	-7	+10	0	+19	-1	+	+
Valencia Community College (CIM)	+2	-4	+6	0	+7	-1	+	+
Valencia Community College (Health)	+2	-1	+3	0	+11	-2	–	+
Valencia Community College (Tele)	+8	-2	+10	0	+10	0	+	+
Waubonsee Community College	+2	-4	+6	0	+8	-1	+	+
West Virginia Department of Education	+1	-2	+3	0	+7	-1	+	+
West Virginia Northern College	+5	-2	+6	-1	+6	-2	–	+

Appendix D

BRIEF DESCRIPTIONS OF FY1988 GRANTEES SURVEYED OR VISITED

Richland School District, Kennewick, Washington

The original plan, largely implemented, was to introduce a one-year course in materials science and technology (MST) to seven high schools and one community college. The MST course curriculum had already been developed by a teacher at Richland High School with support and technical assistance from Battelle Northwest Laboratories (the private partner). The course was a 180-hour, hands-on, science and vocational course about glass, ceramics, metals, composites, and wood. Two teachers from each of the seven high schools were trained in a three and a half week summer workshop. They adapted MST outline and workbook to their own school and local needs, and trained 237 students during the 1989-90 school year. One site dropped out at the mid-year point because of school construction and staff turnover.

Northampton Community College, Bethlehem, Pennsylvania

The National Training Center for Microelectronics at NCC proposed to providing local manufacturing companies (the private partners) with customized job training in surface mount technology (SMT). During the grant period, the Center expanded its existing training program in SMT, enhancing four existing courses, creating seven new courses, acquiring new equipment, and producing a national teleconference. The project trained 233 employees of seven microelectronics firms during the grant period at reduced or no cost to the companies. The project also reached an estimated 2000 employees at 18 locations nationwide through two four-hour teleconferences, one of which was interactive. The subject of the conferences was "Packaging in the 1990s," and videotapes of the teleconference were sold to private companies and donated to other universities. The project was generally implemented as proposed, but trained only about half as many students as planned because companies enrolled fewer students than predicted.

Valencia Community College, Film, Orlando, Florida

The VCC staff established as proposed film production technology program to train students for jobs in the growing local film industry. With technical support from Universal Studios (the private partner), VCC developed the program's curriculum and implemented a 15-week course offered three times during the grant. A total of 135 students were trained in stagecraft, sound, set construction, camera/editing, and post production. Together, the three sessions produced a full-length feature film entitled "Sealed With A Kiss." The project was implemented as outlined in its proposal.

Valencia Community College, Manufacturing, Orlando, Florida

VCC proposed providing a local manufacturing company with customized job training in automated manufacturing technology. VCC was already working with Stromberg-Carlson, Inc. (the private partner) under a State of Florida grant to help Stromberg-Carlson introduce high technology-based manufacturing processes. During this project, VCC trained 565 Stromberg-Carlson employees with the curriculum designed under the earlier grant. A total of 26 classes were offered in 17 different courses; the courses averaged 65 student contact hours. The project was implemented as proposed, although 30 percent of the students dropped out prior to graduation due to other demands on their time.

University of Wisconsin - Stout, Menomonie, Wisconsin

The project proposed implementing a "model" high technology training program in three technical colleges and 12 high schools in UW-Stout's service area. Project staff conducted an initial four-week summer workshop and trained teachers from the participating secondary schools and postsecondary technical institutes how to conduct local needs analyses and to develop module curriculum. Teachers at each school interviewed local industry officials to determine high-tech training and skill needs and to develop course modules. Teachers spent the 1989-90 school year preparing their module(s) and testing them in classes. The project planned to complete 41 modules--ranging from a few hours to a full semester of instruction. The project was implemented as proposed except that teachers at the participating technical colleges did not have time to begin training employees of the private sector partners.

Skyline Community College, San Bruno, California

The vocational division at the college proposed a joint training program for service technicians with Toyota Motors Sales (the private partner). The program, called T-TEN, included 16 weeks of formal instruction per year for three years and part-time work at a reduced wage in Toyota dealerships. Toyota provides financial incentives to the college and to students for implementing and graduating from the program. The project was underway, with state finance, prior to the Cooperative Demonstration grant. Potential students were recruited through newspaper ads and selected by dealership personnel during an annual meeting. The college began the process of obtaining national certification for its automotive program (NATEF). At the end of two years, a total of 17 students were enrolled in the program and two Skyline instructors had received extensive Toyota training and developed the training curriculum using Toyota materials. The project was largely implemented as planned, except 1) there were fewer participants because there were fewer job opportunities with Toyota dealerships, and 2) most students ended up working full-time because they needed the money and dealers needed the staff.

Ventura Community College District - Moorpark College, Moorpark, California

The original plan was to establish a coordinated high school-college program in electronics and laser/electro-optics for at risk students in 8 high schools. In addition, the local business/labor council (BLC--the private partner) would arrange for field trips to potential employers, transportation among sites, counseling, and other activities. The project curriculum was to be developed at the college. The initial plan was modified considerably over the grant period. A summer remedial basic skills program was not held. High school instructors received informal training from the college as needed to implement the program. Planned inter-school transportation was simplified. The BLC role diminished substantially. As jobs in laser-optics decreased, college attendance became a more likely student outcome. In the end, however, the schools adopted the college-developed program, 52 students from 8 high schools completed the coordinated instructional program, more are now enrolled in the college. Students received instruction at 4 of the schools for 4 days a week and at Moorpark one day a week.

Indiana University of Pennsylvania, Indiana, Pennsylvania

The initial goals of this project were ambitious--to establish collaborative technical training between Indiana U, county vocational schools, other postsecondary institutions, private trade schools, regional economic development agencies and the private sector. Problems in coordinating with the regional economic development agency, scaled back goals. In the end, the project delivered a variety of short-term training programs to the employees of smaller manufacturing and other firms in the area (the private partners) at no cost to the companies or employees. Courses varied from basic math to the use of sophisticated computer controlled machinery. Most courses were offered by the county vocational schools and approximately 648 students received training or attended product demonstrations. Thirty-three classes were organized.

Francis Tuttle Vocational-Technical Center, Oklahoma City, Oklahoma

Based on telephone survey only: The goal of this project was to increase enrollment in the High Tech Center within the institution by providing academic remediation to adults who would not otherwise qualify, and to extend formal instruction with internships. This project was largely implemented as planned. A recruitment campaign was undertaken and a self-paced learning lab installed. To attract students, the project provided tuition reimbursement for 220 students without regard to financial need. Eighty percent of the Center's students used the lab. Internships with stipends paid from the grant were provided to 20 students (sites were the private partners). The project recorded a substantial increase in enrollments and a dropout rate of 30 percent.

Appendix E

SUMMARIES OF FY1989 GRANTEES VISITED

Bronx Community College
Bronx, New York

Bronx Community College (BCC), one of the City University of New York (CUNY) Colleges, is located in the hub of urban activity. The Radiologic Technology (RT) Program, funded by the Cooperative Demonstration Program grant, was administered through the Physics Department at BCC.

The goals of the program were to provide students with employment opportunities and to provide hospitals and other medical facilities with trained radiographers in order to increase their employee pool. More specifically, as outlined in the proposal, the program was to:

- Help alleviate the current shortage of radiologic technologists at Columbia-Presbyterian Hospital;
- Help improve the recruitment of Blacks and Hispanics into radiologic technology; and
- Aggressively recruit new workers from nontraditional labor pools including the unemployed, recent immigrants, and older workers.

The work of the partnership would also involve conducting placement tests, arranging for student stipends, offering student advisement, arranging for the program to be accredited, preparing the trainees for licensure, assisting informally in placing students in jobs, and preparing a manual documenting the BBC training model for dissemination.

BCC teamed up with Columbia-Presbyterian Hospital, as planned. After the grant was obtained a second partnership, with Montefiore Hospital, was formed. The hospitals and BCC are all located in New York City. The partnership began with the Cooperative Demonstration Grant. A hospital workers, union, Hospital League 1199, was also a silent partner, granting a tuition loan to union members already employed at hospitals who became RT students. The loan will be forgiven if students work for two years and three months as a union member in the field of radiology.

The role of the hospitals was to provide x-ray facilities and related equipment and supplies for clinical experiences; in-service education; emergency health care services; and free lunch and parking for the students.

Partner meetings took place about once a month. Instructors in the program had previous ties with both hospital partners, therefore informal contact between BCC and the partners was maximized.

The head of the Physics Department at BCC served as the Project director for the RT Program and a program director and two instructors were hired to teach RT courses. The instructors were hired before the program began. The program director and instructors were experienced in the field of Radiologic Technology training and brought with them curricula and course syllabi, which were later revised.

This program intended to serve Blacks and Hispanics, persons with handicaps, and older workers on a larger scale than actually occurred. Because the program was only 18 months long, it did not meet the 24-month requirement put forth by the State of New York. The State agreed to allow students to get credit for an 18-month program only if they had previous college experience. Twenty-one students were enrolled at the beginning of the program, however only 11 were still enrolled by the program's final stages. These included three white Americans and eight immigrants, of which three were white (Russians).

Students participated in the program for 40 hours per week. This included didactic training, which took place at BCC, and clinical training, which took place at the hospitals two to three times a week from 8:30 a.m. to 4 p.m., usually by an RT instructor. Grant money was used in part to pay for students' tuition and a stipend. Union employees received an additional stipend.

Support services were another aspect of the program. Special needs were identified for immigrant students having difficulty with English, and tutors were hired. As the program went on, students with academic problems received tutoring as arranged by the department.

The program has continued beyond the life of the grant, with a 24 month RT associates degree program institutionalized and the continued involvement of all partners. Accreditation was received from the Joint Review Committee on Educational Programs in Radiologic Technology.

The project was originally intended to develop a manual for use by institutions wanting to replicate the model, and a workshop was also proposed. The manual is currently in progress. Dissemination to all NYC/CUNY colleges took place. The dissemination of the program was widespread, mainly through local newspaper articles, the CUNY press, and in RT IMAGE, the major trade journal of the profession.

Center for Occupational Research and Development (CORD)
Waco, Texas

The Center for Occupational Research and Development (CORD), located in Waco, Texas, is a private, nonprofit organization that specializes in science and technical curriculum writing and whose purpose is to help educators address the technical education needs of workers.

CORD used its Cooperative Demonstration Program grant to support the Semiconductor Manufacturing Technology (SMT) program. The goals of the program were to identify skills and develop a curriculum that satisfied the needs of the semiconductor manufacturing industry in the United States, to test the curriculum and skills identified by providing training in two pilot sites, and to disseminate the curriculum. Postsecondary semiconductor manufacturing technology (SMT) training was offered at two community colleges--Texas State Technical College (TSTC), which is also in Waco, and Boise State University (BSU), in Boise, Idaho.

The project was administered by CORD. Its partner, SEMATECH, a consortium of 14 companies involved in semiconductor manufacturing, helped CORD to provide training by defining the knowledge and skills needed for those trained, as well as helping them to develop the curricula needed. The curricula was piloted at TSTC for the general student population, and at BSU for retraining of Micron Corporation employees. SEMATECH's original role was as a link between CORD and industry to locate a retraining site.

About six months after the grant began, the director of SEMATECH died. With the presence of a new SEMATECH director, there was a change in priorities for SEMATECH. This slowed the process of locating a retraining site, but worked to CORD's advantage because CORD was then able to work directly with industry. Before this, SEMATECH was very proprietary about its industry contacts.

Sixteen Micron employees completed training at BSU, and 24 students were enrolled in the SMT program at TSTC, either as full-time majors or students taking SMT courses but who are actually enrolled in other degree programs at the college.

Students at BSU underwent an arduous schedule, attending classes after work from 5:00-8:30 p.m., Monday through Thursday, for five months. They received 283 hours of training. Upon completion of the program, those trained received a SMT Pilot Program Certificate of Completion from BSU and program completion was noted on their internal Micron transcript.

Training at TSTC included 2,400 contact hours of classroom and on-the-job-training. Students in the program began training in September of 1990 and will graduate in May 1992. The on-the-job-training component consisted of constructing a clean room for manufacturing semiconductors. Originally the program intended to manufacture diode packs and interpacks, however building a clean room sterile enough to manufacture these was unrealistic. The SMT director, who was hired after the grant was obtained, realized this and saw that the program would die without a viable on-the-job-training component. He discussed the dilemma with other industry professionals, who suggested manufacturing solar cells, which are used in calculators. The manufacturing process would thus remain the same as was originally proposed. Students were instrumentally involved in construction of the clean room, an unintended but valuable benefit for semiconductor industry workers who frequently deal with machine breakdowns.

The SMT Program began as a direct result of the Cooperative Demonstration grant. The relationship with SEMATECH was a new one, as was the relationship with BSU, while CORD and TSTC have had a longstanding and integral relationship. Several key people were hired to administer the program and develop the curriculum.

The third-party evaluation of the project revealed that:

- The actual partnership and program development model is exemplary, particularly for use in high technology areas;

- The schedule for BSU training was unrealistic. Students were exhausted and expectations of them were too high; and

- The recruitment plan at TSTI needs attention. The strategy is not well planned. A real targeted recruitment plan is needed. Some television advertising reached a few students, but most recruitment was done informally and from pirating other TSTI programs.

The evaluator also reported that all 12 tasks as outlined in the proposal were met to varying degrees, and CORD is in the process of responding to these recommendations to ensure the future success of this continued program.

Dissemination was one of the tasks proposed, and it has taken place on a variety of levels. National dissemination of the SMT model has taken place at the National Coalition of Advanced Technology Centers' (NCATC) fall and summer conferences. A conference was also held at TSTC in May to disseminate the model. CORD also gave presentations at Rensselaer Polytechnic Institute, Applied Materials Corporation, and published information about the model in Economic Development Commentary and six issues of NCATC Newsletter. The SMT curriculum developed by CORD will eventually be sold to any college that is interested.

E-7

Clackamas Community College
Oregon City, Oregon

The Cooperative Demonstration grant to Clackamas Community College (CCC) was used to create a model manufacturing program in precision metals. The program had two goals: to train entry level employees and to upgrade the skills of current employees in response to technological change. The project also targeted special groups, including unemployed and displaced workers, injured workers, career changers, immigrants, women, and other economically disadvantaged people.

The two major partners for the project were the Oregon Precision Metal Fabricators Association (OPMFA) and the Northwest Screw Machine Products Association (NSMPA). The partnership with the OPMFA began in 1988 when the association asked CCC to develop and conduct a training program specifically for the precision sheet metal industry. The associations agreed to loan CCC the equipment to be used in training. CCC then planned and offered a series of evening courses, first at the main campus and then at a new 6,800 square foot training facility 18 miles south of the main campus. The Cooperative Demonstration grant allowed CCC to expand the curriculum, add a basic skills component, and target special populations of students.

Under the grant, project staff developed three major training packages: a work-readiness course, a certificate program in precision metal fabrications, and a certificate program in screw machine technology. The six-week "Work Readiness" course was designed to provide entry level trainees with the basic skills required for employment in the precision manufacturing industry. As the project progressed, the course was renamed "Introduction to Precision Manufacturing Technology" and expanded to eight weeks. The course outline included nine areas: computation skills, basic linear measuring instruments, blue print reading and flat pattern development, project driven operation of shop machinery, industrial operation (through tours), communication skills, forklift operation, first aid and CPR, and work readiness. The forklift training was optional and added to provide students with a specific skill for entry level work in many companies. The project paid half the cost of the $50 forklift license, and the student paid the other half. Because of insufficient time and funds, the first-aid and CPR classes were dropped but later reinstated.

The work-readiness program was offered six times during the grant. A total of 79 students entered the programs, and 65 students (82 percent) completed training. Approximately 80 percent of the students were placed into jobs. Twelve students chose not to seek immediate employment, seven entered the nine month certificate program, two enrolled in unrelated college programs, one student returned to high school, one entered the armed services, and one (a professional musician) chose not to seek employment in the metals industry. The program was offered again in spring and summer 1991 (beyond the requirements of the grant). These programs lasted eight weeks, and each of the 18 students who attended the two sessions paid a fee of $1,195. All students completed the course, and five were employed as of October 1991.

The certificate program in precision metal fabrication and the certificate program in screw machine technology were both developed by project staff. The project hired three instructors from private industry to develop the curriculum and to teach the courses. The programs were nine months long and allowed open enrollment at the beginning of each term. The maximum number of students allowed in each program at any one time was 15. Nine students graduated in precision metals by the end of the grant and seven continued into the autumn of 1991. Eight of the nine graduating students (89 percent) are employed (one was under 18 and too young for employment in the industry). Nine students graduated from the screw machine technology program by the end of the grant, and nine continued into the fall 1991 program. Six of the nine graduating students are employed at local screw machine companies. One student moved out of state and chose not to accept employment in the industry. Two other students graduated at the end of August 1991, one of whom started his own company.

The metal fabrication curriculum was assembled and published in a book called The Shear Edge. The text was copyrighted in 1990 by the Oregon Advanced Technology Consortium (OATC). It contains 25 chapters and two appendices, one of which is a glossary. The screw machine curriculum also is available as are the competency based curricula for the work-readiness program.

Students were recruited through a variety of efforts. Project staff visited local high schools, alternative schools, employment offices, adult and family service offices, community colleges, the Refugee Center of Oregon, local JTPA and PIC offices, Urban Leagues, dislocated-worker programs, and the Life and Career Options classes for abused women at CCC. The project received numerous referrals from private vocational rehabilitation and insurance groups seeking retraining for injured workers. The staff put ads in local newspapers, sent specialized mailings to individual industry association members and members of the Society of Manufacturing Engineers, and arranged for public service announcements on KUFO Radio. The programs and courses also were printed in the CCC term schedule of classes, which is mailed quarterly to 100,000 residences and businesses. As part of the recruitment effort, the project produced two 10-minute videos promoting the job opportunities in the two areas and the two certificate programs. The project also produced a 30-minute repeater videotape containing a 75-second introduction to the OATC, which consists of CCC and three other community colleges that provide technology transfer and training to Oregon industry.

Applicants were assessed first through a standard college placement exam in math, reading, and writing. If the applicant passed the exam, he or she met with the program instructor for a personal interview and performance tests involving spatial relationships. The personal interview allowed the instructor to adapt course content to the needs of the immediate group. Applicants not passing the test were referred to refresher math courses prior to entering the program. Students accepted by the program were provided free training.

Of the 79 students enrolled in the six sessions of the work-readiness program, 35 percent were female and 18 percent were minority. Half the students were aged 25 to 35. Of the 16 students in the Precision Metal Fabrication Program, 12 were male and four were female, and two were ethnic minorities. Of the 16 students in the Screw Machine Technology Program, 15 were male and one was female; none were ethnic minorities. In spite of advertisements in local newspapers targeted to minorities, there was relatively low participation in the project by minorities for two reasons: first, training was located at a facility 18 miles from the main CCC campus and not accessible by public transportation. Most of the unemployed and underemployed targeted population lived in Northeast Portland and did not have private transportation to reach the center. Second, the use of the math and reading college placement exam screened out any minorities not having the necessary background to score highly enough on the tests.

The two partner associations played an active role in the project, and involved several other companies as well. The partners identified competencies needed in training, reviewed the curriculum, helped advertise the project, sent students to participate, donated funds to help with equipment maintenance and tooling costs, and arranged for short-term training for project staff. They also paid to print 10,000 additional brochures and 150 videos for the project. One company owner and association member even served as a part-time instructor. The OPMFA arranged for U.S. Amada Limited to loan CCC a new $250,000 CNC laser cutting machine and an $80,000 bending machine. The equipment was loaned with the understanding that U.S. Amada could bring potential customers to CCC to see the equipment in operation. Other companies loaned other types of equipment as well or metal stock to be used in class exercises.

Grant funds also were used to pay for staff development. Instructors for the work-readiness and certificate programs attended a "train the trainer" program during the summer of 1990. The three primary instructors all came directly from industry and had no prior teaching experience. They attended a "Power Presentation Skills" seminar later in the year as a follow up to their earlier training. This seminar was designed to make instructors more effective at teaching adult and disadvantaged students. In addition, CCC faculty received training on the equipment loaned to the center. One instructor attended a weeklong seminar at U.S. Amada to learn the operation of the CNC laser cutting machine, and another support staff member attended for two weeks. The instructors also attended training in Brooklyn on the CNC plasma cutting machine. One instructor attended a course on the coordinate measuring machine.

In addition to the lack of public transportation to the training center, the project had two other implementation problems. First, the downturn in the local economy after the start of the project made employers hesitant to hire new workers. It was difficult to place graduates and students had to spend more time looking for jobs than originally anticipated. Second, the donated machinery was expensive to transport to the training center and created maintenance and tooling needs. The original grant budget had not provided resources for the maintenance of equipment, and instructors had to spend time finding additional resources and materials.

Hampden County Employment and Training Consortium
Springfield, Massachusetts

The Hampden County Employment and Training Consortium applied for a Cooperative Demonstration Program grant in FY1989 after having received its first Cooperative Demonstration grant the year before. The first grant supported "Project CREATE" (Cooperative Resources to Enhance Access to jobs through Technology Education), which provided 167 adults with hands-on training in the maintenance and repair of computerized numeric control (CNC) machinery, high tech automotive repair, and printing and graphics. The first grant offered eight skill training programs and 1,133 hours of training across all eight programs. The second grant supported "Project: High Tech '90," a program designed to recruit and train disadvantaged youth, women, minorities, and underskilled adults in approximately the same three career fields: automobile repair, graphics and printing, and machining. The first grant ran from January 1989 through June 1990, and the second grant ran from July 1990 through December 1991.

Much of the project infrastructure and partnership arrangements from the first grant were carried over to the second grant. The same consortium staff were used on the project, although staff shifted positions because of the sequencing of projects. The administrative offices were the same, as were four of the partner organizations: Springfield Technical Community College, Dean Vocational Technical High School, Westfield Vocational Technical High School, and the Massachusetts Career Development Institute (MCDI). The course content and structure also were similar from one grant to the next, and all but one instructor was rehired.

There was, however, an important difference between the two grants. "High Tech '90" emphasized much more heavily the recruitment and training of disadvantaged and nontraditional populations. Both project staff and partner staff were involved in recruiting students for the no-cost, open enrollment programs. Staff developed flyers that were sent to community-based organizations, prepared a videotape that was played at local social services office, set up offices at the partner organizations, and ran cable TV and radio announcements. There was no screening for either prior skill levels or motivation (a fact later regretted), and all applicants were accepted. Project staff worked with the automotive instructor at Dean to translate training materials into Spanish for Hispanic students. Dean also hired a bilingual instructional aide to work with the classes. Counseling staff at several of the schools tracked the High Tech '90 students more closely than regular students.

The project set recruitment targets of 25 percent Hispanic and 40 percent female. The training programs were able to enroll a higher percentage of minorities and females than the regular programs offered by the partners, and several schools are continuing their minority recruitment after the end of the grant. The project, however, did not meet its target. The project was able to achieve 19 percent Hispanic, 16 percent black, and three percent Indian participation. Approximately 21 percent were female. One of the most difficult aspects of minority recruitment was getting some staff members in the partner organizations to change their attitude about women in nontraditional occupations and the involvement of minority and other disadvantaged populations. The partners were accustomed to being paid by the JTPA agency based on student performance and so were reluctant to take students who might not finish training or who were ethnically different from their other students.

The project offered seven training programs in six different areas (the pretraining program was repeated twice). The first was a training program for 125 secondary students from nontraditional backgrounds to familiarize them with technology career fields. This program was offered twice by Springfield Technical College, and each program consisted of ten ours of training. Of the 125 students starting, 115 completed the training. Because these were secondary students still enrolled in school, none were placed in jobs.

The second program was 400 hours of training in desktop publishing and printing at MCDI. Of the 20 students participating, 13 completed training, and six were placed in jobs. MCDI hired a new instructor from industry to teach the course because the instructor from the first grant was now teaching regular classes. The start of the training was delayed three months while MCDI searched for a new instructor. The new instructor then had one month to develop his course using pieces of courses and materials from similar courses in the area. One of the project staff served as the instructor for the desktop publishing component. The class applied its training to the publishing of a project newsletter, Access, which was printed on donated paper and mailed to approximately 100 businesses and organizations in the area.

The third program was 254 hours of basic machining training at MCDI. Of the 20 students participating, 12 completed their training, and six were placed in jobs. One of the female students trained under the first grant became an instructor for the second grant.

The fourth program was 254 hours of automotive repair training at Dean. Of the 24 students participating, 16 completed training, and eight were placed in jobs.

The fifth program was 96 hours of computer aided design/computer aided manufacturing (CAD/CAM) training at Springfield Technical College. Of the 22 students participating, 18 completed the course. All the students were employed at the time of training, and so there were no further job placement activities.

The sixth program was 48 hours training on computerized numeric control machining for currently employed machine shop workers. Training was done by Westfield Vocational Technical High School. Of the 15 machinists trained, all completed training and were working at the time of graduation.

During the duration of the project, the economy of western Massachusetts was severely affected by the recession, and employment opportunities for new entrants into the automotive and machining fields became scarce. Employment opportunities in printing and graphics arts were somewhat better but still reduced from pre-recession levels. Consequently, the project had very low employment success: 25 percent entry for automotive, 40 percent in machining, and 55 percent in graphic arts and printing. The overall impact for those employed was lower starting wages than had been expected, longer job searches, and still uncertain futures. As the recession worsened, project staff shifted emphasis from skill training to support services such as resume writing, interviewing skills, and job placement.

There was no advisory board for the project and no general meetings of representatives from the partner organizations. The project staff's experience in the first grant showed them that attendance at such meetings was sporadic and that it was more efficient to interact with the partner organizations one-on-one. In addition, the consortium was also a research organization that collected job market information on a regular basis; no additional information was needed from private industry. The staff time that would have been spent on advisory board activities was directed toward starting discussion groups with high school students regarding their career expectations.

The curriculum packages developed by the project (and its predecessor grant) are provided free to anyone requesting copies. The packages are suitable for use by other vocational schools and technical colleges. Procedures used for recruiting students may be of use to other schools, as evidenced by one partner school having expanding its regular recruiting process to incorporate the project's procedures.

The project used the newsletter to publicize the content and accomplishments of the project. Although the newsletter was sent to over 600 individuals and organizations, including the other grantees, there were few requests for information. Two other grantees came to review the project, but it is not known if any of the project's features were implemented elsewhere. Copies of the CNC curriculum were mailed to anyone requesting them. Project staff also made presentations at state and national conferences, e.g., AVA.

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Home Builders' Institute
Washington, D.C.

The grant to Home Builders' Institute--a subsidiary of the National Association of Home Builders (NAHB)--was designed to develop a model curriculum to train and certify employed master electricians and second-year apprentices as installers of SMART HOUSE. SMART HOUSE is a high-technology home automation energy, distribution, and control system, currently under development by an NAHB spin-off organization. The proposal anticipated instructional design and development, production of training materials, student recruitment, instructor training, pilot training at three sites, assessment, and dissemination to participating vocational institutions.

As executed, the project encountered problems that led to changes in its scope and timing. A delay in the development of the SMART HOUSE technology and failure to reach agreement with SMART HOUSE developers on the nature of installer training led to a shift in curriculum development. Instead of SMART HOUSE, the curriculum that was ultimately developed instructs students on the installation of a generic home automation system that uses existing home wiring systems. As a result of the SMART HOUSE problems and subsequent changes, curriculum development was set back between 12 and 18 months. In addition, there was a change in project directors after the first year, and several changes in staff writing the instructional materials.

Once the decision was made to develop the more generic home automation curriculum, information was sought from a variety of sources. An advisory committee was formed with members representing a variety of home automation manufacturers as well as users. Committee members reviewed curriculum drafts. Most of the curriculum writing was carried out by staff and consultants of Home Builders' Institute. A final, revised curriculum for an 18 hour installer training course was slated for completion in December, 1991, but the project has applied for an extension to June, 1992.

Three sites were recruited for pilot testing, which has taken place at two of them. The project has trained 15 instructors and 16 students at Mid-Florida Technical Institute, and 1 instructor and 10 students at Tidewater Community College. Students included working electricians as well as current students at the two schools. The training at Mid-Florida was conducted by a Home Builders' consultant, while the training at Tidewater was conducted by one of the trained trainers. Pilot testing at the third site was scheduled for December, 1991, but canceled because of insufficient registration. It may be held in March, 1992. In addition, some instructors from pilot sites have received SMART HOUSE training in order to fulfill agreements made with the sites prior to the shift in project emphasis.

As a result of pilot testing, the curriculum is being revised. Student evaluations suggested that training be made less elementary and more technical. In addition to changes in the course text, the project is developing audio/visual support (videos and overheads to introduce the Home Automation concept) as well as templates for laboratory hands-on manipulation.

Clearly, dissemination of the curriculum has not yet occurred, as the curriculum is not completed. Dissemination was originally slated to be conducted by Partners for American Vocational Education as well as Home Builders' Institute.

Howard Community College
Columbia, Maryland

The grant to Howard Community College was designed to develop a model curriculum for a refresher course for persons returning to nursing after an absense of five or more years. The proposal anticipated changing an existing refresher course by updating the competencies taught and by developing and using interactive videodisc technology (rather than having to purchase expensive high-tech equipment). Howard Community College planned to work on this project in combination with Essex Community College and two local hospitals that provide clinical sites for refresher course participants. Although the original proposal did not go into detail, the project envisioned a major revision in the refresher course already offered, with videodiscs developed under the grant playing a major role in instruction. As the proposal stated,

> A 12-week, 150-hours course will be held in the winter/spring semester of 1991. Eighty hours will be spent using the videodisc, attending class lectures, and in lab practice; 65 clinical hours will be devoted to patient/client contact, with another five hours in conference in participating hospitals. The classes will be led by the same instructor who had previously taught these courses so that significant differences in class outcomes can be attributed primarily to the addition of the videodisc rather than a change in instructors.

As originally planned, 40 students would be recruited for the course, and the intended goal was a 90 percent completion rate. In addition, the curriculum and discs would also be "piloted" by nursing staff and students at a minimum of 10 institutions.

As executed, the grant led to the development of a seven-minute recruitment film and three interactive videodisc "sides" (like the side of a tape or record) on the subject of volumetric pumps. The content and scripts were developed by project personnel (director and instructor) and reviewed by an advisory committee that included hospital representatives. Actors and project personnel were used to tape the videos. The videodiscs, along with a workbook, were subcontracted to SETS, a marketing firm, and Digital Video Corporation, which actually programmed the discs. Project staff and the advisory committee reviewed the discs during development, and one of the interactive videodiscs was also reviewed by nursing staff at seven other teaching institutions. Programming for the videodiscs was still being refined in December 1991, six months after the grant ended.

The videodiscs were incorporated into the refresher course for nurses, but delays in the development of the discs meant that students were exposed to a work in progress, rather than to a finished set of discs. Twenty-nine students were recruited to the refresher course. As noted by the third-party evaluator, other than the introduction of the videodisc, few changes were made in the refresher course as the competencies taught in the course were "found to be current" after being reviewed by project staff and the advisory committee. Estimated instructional time devoted to discs was about six hours. The evaluator found that students who used the interactive discs in instruction appeared to be less anxious about taking care of patients on machines, compared to students who took a similar course without the discs.

One videodisc was sent to 13 institutions and seven of those institutions completed the feedback forms from students and faculty after using the videodisc. According to the third-party evaluator, "A total of 115 students and 12 faculty reviewed side one of videodisc one..." and that number includes the 29 students at Howard and Essex.

Twenty-nine students were recruited to the refresher course at Howard and Essex, and all but one completed the course. Not all of the students sought work as nurses, and because of staffing cutbacks, neither hospital participating in the project hired anyone who had completed the refresher course. One hospital had major personnel and organizational changes that interfered with its involvement. At the time of the followup, 15 of the 29 participants were employed and 10 were in settings where high-tech equipment was being used (described as "nursing related work").

High-technology aspects of this project included the use of interactive videodiscs as well as training to work on high-tech equipment (computer-driven volumetric pumps). The project was a new one for Howard Community College, which had never developed an interactive videodisc. The nursing program was well established however. The college had previously received a grant from the state to develop the refresher course. No new staff were hired for this project; all staff were already employed at Howard, Essex, or the two hospitals.

Dissemination was delayed because programming for the interactive videodiscs needed further revision from the feedback from the pilot sites. The project director has presented information on the discs at several national meetings. She also credits the disc development with having received a Fulbright Scholarship for next year. Howard will sell the discs in conjunction with SETS. The project director indicates that the Federal monitors have okayed an arrangement in which SETS and Howard will share the profits, with Howard receiving 20 percent.

Illinois Eastern Community College
Olney, Illinois

Olney Central College (OCC) is one of four branches of the Illinois Eastern Community College (IECC) system. OCC is a small college offering two-year associates degrees in a predominantly agricultural area of southeastern Illinois. The training in semiconductor technology program (SemiTop) began as a result of the Cooperative Demonstration grant. The purpose of the project, as stated in the proposal, was to train students to become technicians and operators in the semiconductor or chip fabrication industry and to establish this program as a model of business/college partnerships in vocational education. The objectives were to:

- Integrate additional technical course offerings at IECC into the semiconductor technology, level I program, which will be offered as part of the IECC curriculum;
- Recruit at least 20 students into the program by August 1990;
- Train these students in a program that will lead to industrial employment or training at Level II; and
- Develop the Level II program by June 30, 1991.

This project intended to train students in the classroom and introductory laboratory experience (Level I) and develop an advanced laboratory curriculum (Level II). The second year of the program was to take place in a simulated microchip laboratory or "clean room" on Olney's campus, but this never happened. In the application, a diagram of the sterile laboratory was provided. According to the project director, there was an error in the type of simulated laboratory environment discussed in the proposal--only an authentic sterile environment would make an adequate laboratory. The evaluator eventually discovered that there was miscommunication between the project director and OCC about exactly what classroom space and laboratory the college would provide for the SemiTop project. The project director spoke of "leveraging" one grant with another and sought assistance from the State of Illinois to fund the sterile laboratory. This never occurred, and no other plans currently are under way to secure funds. The result was that the 19 students originally enrolled in SemiTop training did not receive a two-year degree in Semiconductor Manufacturing as originally planned, however they did complete the Level I courses.

One student who did complete the class got a job with Intel Corporation. Eight students continued their education at OCC in a different program, and seven students did not complete Level I training.

Level I training was taught by instructors already employed at OCC. A lab assistant, who also served as a full-time tutor, was hired as a result of the grant. Students typically took four or five courses--a full-time course load for the first and second semesters.

This partnership was unique because Olney Central College's partner, Intel Corporation, was located hundreds of miles away in Phoenix, Arizona. Intel's major role was to supply equipment and contribute to staff development and curriculum development during four meetings held at OCC during the summer of 1990. Instructors received training which enabled them to include a semiconductor component to their already-existing curricula, in such areas as math, physics, computers, and chemistry. Intel also was going to install the equipment it donated as part of its role in the partnership, but this never came to pass.

SemiTop dissemination included the project director's attendance at a SEMATECH (a consortium of 14 semiconductor manufacturing companies) meeting, conferences, and distribution of the curricula to anyone requesting it. A paper was written about the SemiTop experience and was delivered to the National Association for Science, Technology, and Society in Washington, D.C. in February of 1991 at the Technological Literacy Conference. A SemiTop manual was also disseminated to the ERIC (Educational Resources Information Center) Clearinghouse.

Indian Hills Community College
Ottumwa, Iowa

The Indian Hills Community College's (IHCC) Demonstration Model Project was developed to provide a degree-bearing second year course of vocational study to non-traditional students seeking high technology training. The program was developed as a flexible competency-based program offering an opportunity for skill enhancement and a college degree. As stated in the proposal, the project offered three paths of study:

- A course of study in Personal Computing resulting in a diploma or an associate degree;
- An Associate of General Studies (AGS) degree in Advanced Technology, specifically tailored to meet student and industry need, and;
- Courses to be taken for skills upgrading and enhancement.

The program was designed as an individualized self-paced approach to study, utliizing flexible study time, lab time, industry representatives, educational facilitators, and other college personnel. The project offers the non-traditional student, including women, minorities, displaced homemakers, and others seeking advancement opportunities, the chance to design a degree program made up of a combination of interdisciplinary courses technically-focused to meet real world needs.

The project featured three educational components each being twelve months in length. All the programs were offered in the evening, and were self-paced with flexible hours and facilitators present.

The Microcomputer Specialist Diploma component was a 24 semester hour offering in Personal Computing. It was a one year program for students seeking proficiency in microcomputer software applications and resulted in a diploma. This component when combined with an

Electronics/Computer Operations diploma from IHCC's traditional offerings could result in an Associate of General Studies (AGS) in Advanced Technology degree.

The AGS in Advanced Technology component was designed as a second year degree-bearing program in high technology. The first year of training was obtained by students that completed the college's Electronic/Computer Occupations diploma program through the traditional curriculum prior to starting the AGS training.

Utilizing the AGS program, with assistance from an academic advisor and an advisor fron the area industry, students combined High Technology courses and credits from other disciplines, to specifically gear skills to suit the needs of area industry. However, a student's AGS in Applied Technology plan was subject to IHCC Academic Standards Committee approval prior to the start of course work.

The third component was made available to train students in second year High Technology programs on a course-by-course basis while accumulating college credit. The courses allowed current employees of industry to upgrade skills or train for new responsibilities that would enhance mobility and productivity on their jobs.

In all three components, industry volunteer advisors were enlisted on as as needed basis to assist in helping students custimize their AGS programs. Also eight current IHCC instructors/specialists were utilized as "experts" to assist students in understanding high tech speciality concepts in each component. These experts were used four hours per week each to supplement the full-time educational facilitators during the non-traditional delivery hours.

In this project, students time is flexible allowing them to put in their contact hours at convenient times based on work schedules or child care, etc. The students must however, start and complete their required contact hours in accordance with the college term calender. It requires good time management on the part of the student and consistant motivation and monitoring on the part of the facilitator.

As specified in the proposal, the program goals were: 1) to provide outreach efforts to 200 potential program participants; 2) register 25 and graduate 15 students in the Microcomputer Specialist Diploma component; 3) register 15 and graduate 12 students in the AGS in the Advanced Technology component; 4) Register 20 and have 20 students complete at least one course in the course-by-course component, and; 5) of the total number of participants, at least 66% should be women.

The actual numbers registered were greater than expected in some components and less than others. However, the overall total registrants exceeded the original goals. Of those registered in the Microcomputer Specialist Diploma component, 5 completed their course work. The AGS in Advanced Technology component graduated 10 students, and the Course-By-Course component had 14 completers.

LTV Steel Company
Whiting, Indiana

The LTV Steel Company applied for a Cooperative Demonstration Program grant to support a portion of its apprenticeship program in Electronic and Instrument Repair. The apprenticeship program was started in 1988 by the Employee Development Department as part of LTV's $320 million in capital investments in its East Chicago plant. The installation and modification of new equipment required the creation of a new occupation--Electronic Instrument Repair Technician (EIRT)--and the retraining of a portion of the existing workforce. An EIRT repairs/replaces temperature, pressure, and flow measurement instrument components as well as the digital and analog electrical systems with which they interface.

The EIRT apprenticeship training is a four year program providing 8,320 hours of classroom and lab instruction. Trainees are given one day of classes a week at the Calumet Campus of Purdue University, one day per week of lab at the training facility at LTV Steel, and the balance of time in on-the-job training. Two courses are taught each semester, and a semester lasts 14 weeks. The four-year program is considered a more desirable arrangement than having people with a full-time two- year associates degree plus two years on-the-job-training.

The EIRT training is open to all of the plant's hourly employees. Interested workers apply to the program and must pass a reading comprehension and math assessment to be eligible. Apprenticeship positions are then awarded to eligible workers on the basis of plant seniority and consistent with "Consent Decree No. 1" signed in the U.S. District Court for the Northern District of Alabama in 1974. The decree specifies minority representation in apprenticeship programs in selected craft families. Once a worker has started in the EIRT program, he or she cannot withdraw for a minimum of 45 days. Apprentices receive wages stipulated in the current labor agreement and are expected to earn over $101,500 for the 8,320 hours of training.

The first cohort of apprentices started in June 1988 and consisted of 25 students; 17 students still remain in the program. The second cohort started in September 1988 and consisted of 25 students; 16 students remain in the program.

LTV's grant was used to support 18 of the 48-month EIRT training for the third cohort of apprentices. The third cohort started in January 1989, and 28 students completed the grant-funded portion. The LTV Manager of Employee Development Programs applied for the grant (LTV's first federal grant application) after hearing about the Cooperative Demonstration Program from an official in the Illinois Department of Labor. The Manager had contacted the Department in an effort to find public funding for equipment needed to establish a process control lab at the Calumet Campus. LTV had received small grants from the state in the past to pay for various job training activities and LTV hoped to find similar funding. LTV agreed to donate approximately $150,000 of equipment for a lab if Purdue would handle the installation and software programming.

The 18-month component funded by the grant consisted of three sections of training:

1) Orientation (11 weeks)

   General Program Orientation and Shop Location;
   General Shop Safety
   Basic Mathematics
   Principles of Basic Physics
   Basic DC Electricity

2) Data Collection and Communication Devices and Systems (37 weeks)

   Safety
   Electronic Circuits I
   Hydraulics/Pneumatics
   Print Reading
   Basic Electrical AC
   Electrical/Instrument Devices
   Troubleshooting Techniques

3) Control Devices and Systems (30 weeks)

Safety
Electronic Circuits II
Digital Devices and Systems
Instrumentation
Basic Computing and Hardware
Instrument Test Equipment and Analyzers
Troubleshooting Techniques

The curricula for these courses were developed prior to the start of the grant by the private partner, the Electrical Engineering Technology Department at Purdue University-Calumet. The department assigned an instructor to work with LTV when LTV solicited the proposal for the EIRT training program in 1988. LTV had solicited similar proposals from other local vocational and educational institutions, but Purdue was the only one to respond with interest in developing curricula and lab experiments specific to LTV's needs. LTV selected Purdue in late spring of 1988 in spite of the much higher cost of their proposal.

The Purdue instructor visited the mill several times while developing the initial curriculum to observe the specific control systems the technicians would service and maintain. Training on the specific equipment was critical. Purdue could train in basics of AC and DC circuits and equipment and fundamentals of hydraulics and pneumatics but didn't have laboratory facilities for process control. Portions of the curriculum were already available from earlier apprenticeship programs at LTV, but the instructor had to conduct extensive rewrites to update the available technology. The plant's Joint Apprenticeship committee (comprised of LTV Steel management representatives and representatives of local 1011 of the United Steel Workers of America) reviewed the projected summary of work processes and applied for Certification and Registration through the U.S. Department of Labor, Bureau of Apprenticeship and Training. The program, was certified in July of 1988.

Students are given Knowledge Questionnaires (KQs) and Representative On-the-job Assignments (RPAs) to test their practical job knowledge. These tests and assignments are administered through the Electronics and Instrument Control Department and monitored by the joint Apprenticeship Committee. At the time of the grant application there were approximately 56 KQs and 94 RPAs developed. The Purdue instructor often rewrites the old exams as apprentices progress into new units to reflect what the instructor feels is most important and the latest changes in technology.

The problems encountered by LTV in implementing the EIRT apprenticeship program were the reverse of those encountered by educational institutions receiving Cooperative Demonstration grants. The vocational and education institutions LTV approached for curriculum development and instruction were unresponsive. Although the Dean of the department at Purdue was supportive of the partnership with LTV, other department faculty were not enthusiastic about teaching non-credit courses. The instructor who did take on the LTV assignment (with great enthusiasm and dedication) encountered problems in receiving tenure from the department because of his teaching in private industry. Purdue hired a new instructor to teach the third EIRT cohort, but LTV found the instructor unacceptable and negotiated with the Dean to free up additional time for the original instructor to handle the third cohort as well. The instructor has incorporated portions of the EIRT training into his regular university classes.

Luzerne County Community College
Nanticoke, Pennsylvania

Luzerne County Community College's (LCCC) Advanced Technology Center (ATC) Computerized Numeric Control (CNC) Cooperative Demonstration Training Program was developed partly as the result of a meeting on CNC training convened by Congressman Paul Kanjorski at the Wilkes-Barre Pennsylvania Chamber of Commerce. The meeting was attended by five regional manufacturers who said they were unable to operate at full capacity because of a shortage of CNC operators. Adding support to the need for CNC operators was a national study conducted by the Hudson Institute, which stated that by the year 2000 there would be a need for 61,000 "precision production workers" in the United States (294 of these positions would be in the area served by LCCC).

The project called for refining the existing CNC program by using an interactive video CNC controller simulation in conjunction with the College's Institute for Development Educational Activities (IDEA), making it suitable for those traditionally underrepresented in skilled, high technology operations. The revised program would target groups such as women, the disabled, and racial and ethnic minorities. IDEA would provide the client population with literacy and basic skills training, counseling, placement testing, and other academic support services required to succeed in the CNC program. The CNC training would be offered to qualifying students at no charge and include a $25 per week stipend to help students with travel and lunch expenses. Relationships with the Luzerne County Assistance Office, the Luzerne County Human Resources Development Department, the local office, JTPA, and regional school districts were established to build a client referral system.

Private sector involvement included four companies, one labor council, three development agencies, and three human resource agencies, all of which originally agreed to participate in the planning and operation of the project. In addition, each participating industry in its letter of support and participation, indicated its strong interest in providing some on-the-job-training (OJT) for program participants and possible employment for students who completed the program. Due to the downturn in the economy, companies were not able to follow through on the previously arranged commitment, and the program could not place many of the students in OJT or with local industry employers. The major emphasis of the program therefore was focused primarily on student training.

Because computerized numerical controllers (CNCs) and the equipment they operate are so expensive, it is not feasible for most training programs to have a number of different systems available at a training site. To address this issue, LCCC developed and produced two interactive training simulation software programs, each providing one hour of instruction. The interactive software programs utilize computer-based interactive videodisc (IVD) instruction and a touchscreen monitor to simulate two different CNCs used by local companies. With this software, the user is able to press the actual video images of the CNC keys (displayed on the screen) and perform basic simulated functions. Because the two CNCs selected for this project are in common usage, other training institutions and job sites can use the materials LCCC developed.

Originally, the software was to be developed in the first half of the project and used for training during the second half. However, the development of the interactive video took far more time than anticipated. The first disc was finished late, and the second was not finished by the end of the grant, so students were unable to fully utilize the IVD instruction.

LCCC enrolled 58 students into the program. Twenty-six (44.8 percent) successfully completed the program, and 32 (55.2 percent) dropped out. All of the students who completed the program were referred to employers and 10 were employed (eight of whom were hired by partner organizations). Six students continued with their education.

The project modified existing courses in CNC, CIM, and math to meet the lower ability level of student seeking non-traditional career fields. The project relied upon LCCC developmental study courses for remediation where necessary and added internship component for all students. The project used existing LCCC staff except for a project secretary who was hired just for the grant.

The project staff exhibited the interactive video program at "Pennsylvania Technology '91" where they tried, unsuccessfully, to sell copies of the videodiscs. No decision had been made at time of site visit for further duplication and distribution of the discs. The project obtained newspaper coverage for the implementation of the interactive video. Representatives from local companies using CNC equipment, e.g., Midway Tools, have come to see the interactive video training for possible use in their company. Copies of the curriculum packages were sent to ERIC.

Nebraska Department of Labor
Lincoln, Nebraska

Job Training of Greater Nebraska (JTGN) is an agency of the Nebraska Department of Labor that operates employment and training programs under the Job Training Partnership Act. The Rural Allied Medical Business Occupations Program (RAMBO), funded by the Cooperative Demonstration grant, trained respiratory therapists, drug and alcohol counselors, and licensed practical nurses (LPNs). Also one student was trained in histology and one as a lab assistant.

The major goals of this program were to establish partnerships, increase access to health care training, and create new or improved training. But the program's ultimate focus became one of finding jobs for needy people. The five objectives, as outlined in the proposal, were to:

- Help solve rural Nebraska hospitals Allied Medical shortages based upon needs;
- Provide economically disadvantaged individuals...with high-tech medical training which will lead to professional standing in rural Nebraska communities;
- Furnish Job Service, Department of Social Services, Department of Education, and Job Training of Greater Nebraska with the opportunity to refer disadvantaged individuals for training in high-tech occupations.
- Provide individual quality training in a high-tech field over a 12- to 18-month period.
- Provide on-the-job training/classroom training opportunities in high-tech medical disciplines at Saint Francis Medical Center and Central Community College in Grand Island.

JTGN, in Lincoln, Nebraska, teamed with Saint Francis Medical Center and Central Community College, both in Grand Island, Nebraska. The JTGN role was to recruit students and coordinate the partnership. Saint Francis' role was to provide on-the-job-training, and Central Community College's role was to provide classroom training. The partnership planning began one year prior to the grant, but the partnership itself began with the grant.

This partnership was distinct in that it consisted of a very tight-knit relationship among three dedicated partners. The director of RAMBO at JTGN, Central Community College's institutional advancement director, and Saint Francis Medical Center's director of human services, were dedicated to RAMBO and put forth many hours on their own time to ensure the students success.

Support services were also a unique aspect of this program. Remedial help in the form of supplemental coursework taught at CCC was provided to students who needed it. Financial support was also given to students, many of whom were on welfare, to pay for tuition, to help them relocate to Grand Island, and to purchase necessities such as eyeglasses and suitable clothes for job interviews.

All training programs were one year, and all included on-the-job and classroom training. The LPN program included 500 clinical hours. Drug and alcohol training included a 30-day in-patient therapy component; the clinical component included observing group therapy sessions, conducting counseling sessions, and learning how to write master treatment plans. Trainees also were given a caseload for several months at the end of their training, under the observation of program staff.

Some problems with RAMBO included student retention. Twelve students in the program dropped out for a variety of reasons, ranging from academic difficulty to problems with self-esteem. RAMBO staff continually urged these students to stay in the program. Eventually 26 students finished the RAMBO program, all but two of whom were hired following graduation. Some students also had problems regarding State certification requirements for drug and alcohol counselor and certified respiratory therapist licensing, although petitions of waiver for the State requirements were submitted and granted.

The partners are trying to secure State funding with the help of the lieutenant governor in order to continue the RAMBO program. The plan is for the Department of Social Services to assume students' social service needs, JTGN to cover students' tuition needs, and for the State to pay for a project administrator. If the program continues, the surgical technology and certified respiratory therapy programs will not be included because of insufficent need for surgical technologists as well as the AMA requirement that certified respiratory therapists be observed over a three-month period, a requirement that was waived for persons trained under this grant.

No dissemination activities were proposed, although substantial dissemination occurred through television spots, newspaper articles, presentations delivered at national conferences, as well as articles in professional journals. All three partners gave presentations at the following conferences: American Society for Healthcare Human Resources Conference, the Adult Learner Conference, and the National Conference on Rural Adult Education Initiatives.

North Clackamas School District #12
Milwaukee, Oregon

The grant to North Clackamas School District was used to establish the Student Cooperative Training Units (CTU) Program at the district's Owen Sabin Occupational Skills Center. The district had been approached by the Northwest Regional Educational Laboratory (NWREL) to determine if the district would be interested in applying for a Cooperative Demonstration Program grant. NWREL helped the district prepare its proposal and continued to take an active role in the project as both a technical support and third-party evaluator. Other partners in the project were Precision Castparts Corporation, Block Graphics Inc., and Providence Milwaukee Hospital. These partner organizations already had working relationships with the Center's instructors, and those relationships were used to create formal student internship positions at each company.

The grant had seven objectives:

- To coordinate the development of curriculum for Advanced Information Systems, Graphics Technology, and Health Occupations occupational cluster programs to prepare students for entry into those fields;
- To provide students with practical training using high technology tools;
- To pilot the CTU Program in each of three occupational areas: Office Systems, Printing, and Health Careers;
- To refine and revise the curriculum as necessary;
- To operate a full school year CTU program;
- To evaluate the project's impact on participating staff, students, and business; and

- To disseminate the project's approaches, processes, materials, techniques, and findings to state and national audiences.

The Advanced Information Systems (AIS) cluster trained approximately 40 students per year in office systems using a networked computer terminal and a variety of word processing, electronic mail, scheduling, and information management software. Students enrolled in the second year of AIS were eligible to apply for the CTU internship at Precision Castparts Corporation.

The Graphics Technology cluster trained approximately 40 students per year in desktop publishing, comprehensive layout, paste-up, masking, platemaking, offset press operation, hazardous chemical handling, and safety. Students enrolled in the second year of the cluster were eligible to apply for the CTU internship at Block Graphics, Inc.

The Health Occupations cluster trained approximately 140 students per year in human anatomy, medical terminology, and health-related skills. Students enrolled in the second year of the cluster were eligible to apply for the CTU internship at Providence Milwaukee Hospital.

Teachers selected CTU participants based on a student's maturity level, behavior, academic performance, and career interest. Each candidate was referred to a business partner, and students were required to follow the hiring process normally utilized by the business partner's company. They were interviewed by the personnel officer and then referred to the appropriate site supervisor for additional interviewing or skills testing. Students accepted as interns received new employee orientation, a tour of the company, and an employee handbook to review. Upon graduation, students were expected to enter the work force in that industry or continue their education at the community college or university. The private partner made no guarantee to hire students after the internship ended. Although both male and female students participated in the project, no minorities were trained.

The CTU program was operated in two phases: a summer pilot phase and a school year phase. The summer pilot phase began with an orientation session for interested students. Students indicated they would be interested in doing an internship if high school credit was given and if they were paid a stipend to replace the money they otherwise would have earned through summer jobs. Each student was authorized to receive up to 180 hours of training over a four- to six-week period. During the pilot phase it became clear that it was not feasible to train students in groups as had been originally proposed. To compensate for the lack of interaction between students on site, interns were required to record daily entries in journals (in order to improve their communication skills), and attend debriefing sessions where they discussed their experiences. Instructors reviewed the journals each week.

During the summer pilot phase, 12 AIS students started internships, and all completed their training. Of the 12, six were hired the following year under a cooperative employment agreement (even though the company had a hiring freeze), five continued their education, and one was still looking for a job. Seven Graphics students started internships, and all completed their training. Of the seven, two were hired the following year, three continued their education, and one was looking for employment. Five Health Occupation students started internships; four completed training (the fifth dropped out because of a schedule conflict with a second job). None of the five could be hired by the partner because Oregon State regulations required postsecondary training to qualify as entry level technicians in the healthcare industry. One of the most substantial contributions the summer interns made was to draft, edit, and refine a new instruction manual for a software package (Occupational Health Maintenance) purchased by Precision Castparts.

The school-year phase of the project included continued internships at the three partner companies. However, due to school classes and other student activities, students were not able to train for six hours per day as they had done during the summer. The training schedule was first modified to allow three hours per day on-site, but companies had difficulty with that schedule and asked that the time be increased to four or more hours per day. As in the pilot phase, students were placed in internship positions for a period of four to six weeks. During the school year, six AIS students, eight Graphics students, and 11 Health Occupations students started internships, and all completed their training.

The five teachers at the center who taught the three cluster areas scheduled weekly conferences with the internship supervisors at each company, during which the teacher reviewed each student's performance, learned about the impact of technology on the workplace, and became familiar with new equipment or industry procedures. The teachers integrated their new knowledge into their program curriculum and customized their courses to local industry needs. Teachers needed continually to revise their curriculum to fit the rapid changes in the industry. For example, the AIS cluster put more emphasis on personal computers, WordPerfect, and Lotus 1-2-3.

Representatives from the three partners and other businesses sat on the advisory committee for the Skills Center (there was no separate grant advisory committee). The committee was asked to review revisions to the curriculum, and throughout the year teachers discussed with individual committee members any special problems they might be experiencing. Through the committee and through weekly conferences, the partners made specific suggestions about what topics they wanted to see included. Precision Castparts requested that excepts from their employee handbook regarding grooming, attendance, and performance expectations be included in program orientation. Block Graphics asked that training in handling hazardous chemicals become a prerequisite for placement at its facility. Providence Hospital suggested that more emphasis be place on computer literacy.

Partners for American Vocational Education (PAVE)
Alexandria, Virginia

Partners for American Vocational Education (PAVE) is a private, nonprofit foundation organized to create partnerships between business, industry, and education. PAVE managed the Cooperative Demonstration grant, which consisted of partnerships established between a coalition of employers and a coalition of educational institutions. PAVE is in Alexandria, Virginia, and most of the employers and educational institutions involved in this grant are located in nearby Washington, D.C.

This project, called Business-Education Venture for Health Care Occupations Training, had two primary goals:

- To develop and implement an effective Business-Education Venture that will maximize the resources of education institutions and health care providers in the District of Columbia to train and place skilled technicians in the health care industry; and
- To field test a health care high technology Business-Education Venture that will enroll 150 persons in training programs that will provide them with skills to increase their value, performance, and employability as technicians in the health care industry.

Student training was conducted in five areas for health care workers:

- Nurse occupations technologies, which provides a minimum of 75 hours of lab work and on-the-job training:
- Medical transcription technology;
- Phlebotomy technology;
- Medical records apprenticeship; and
- Medical unit clerk courses.

These training programs typically were six to nine hours per week for 12 to 14 weeks. Cost per student ranged from $25 to $150. Participants registered by telephone through the PAVE-run Health Care Training Hotline. Prior to training, students were assessed using Valpar MESA Short Form, an assessment software package.

Approximately 71 students, half of whom were already employed, completed specialized health care training provided by PAVE. Approximately 75 percent of those students not having jobs upon entering the programs found employment upon completing the program:

- One hundred percent of 18 phlebotomy technology completers;
- Seventy-one percent of 35 nurse occupations technologies completers; and
- Seventy-two percent of 18 medical transcription technologies completers.

The medical records apprenticeship and medical unit clerk courses did not yield certificates of completion; 27 students took part in these courses. Fifteen students received some degree of remediation, which PAVE managed using BASE software.

One unforeseen problem PAVE experienced was the extensive "fall out" between the time initial contact was made and participants actually were enrolled in training: although 255 students initially contacted PAVE, only 196 enrolled in training. And, a high number of students (35 percent) dropped out of programs before their training was completed.

PAVE's relationship with its partners was different from other Cooperative Demonstration grantees for several reasons. First, PAVE's role was to manage partnerships. It oversaw the partnerships formed between the coalitions of health care employers and education institutions mentioned earlier. The coalition of employers included the Washington Hospital Center, Howard University Hospital, Greater Southeast Hospital, Childrens' Hospital, Little Sisters of the Poor (a long-term care nursing home), and the Washington Nursing Facility. The educational institutions that provided training included the District of Columbia Public Schools and the University of the District of Columbia. Thus, PAVE established many different networking partnerships with each of these institutions, and it facilitated training between them. This third-party management feature made this program unique.

This grant also was unique in that PAVE took over the role of referring students to existing training programs, although some of these programs were adapted to meet the needs of PAVE trainees. PAVE's role was to recruit students for existing training, instead of the more common Cooperative Demonstration grantee role of actually providing the training.

High-technology aspects of this program were the nursing procedures and technologies used, particularly in the phlebotomy technology and nurse occupations technologies training programs.

Dissemination of program activities were to include a guide on the development of a Business-Education Venture, a manual to facilitate model replication as outlined in the proposal. Instead, a briefer version of this manual, with a broader focus, was developed in the form of guidelines. These were disseminated to State directors of vocational education and State councils on vocational education.

Southwestern Community College
Chula Vista, CA

Southwestern Community College (SWCC) received a Cooperative Demonstration grant to design and implement a Comprehensive Aerospace Manufacturing Technology Program. As originally proposed, the college was to develop a program that would train disadvantaged individuals for jobs in aerospace; upgrade skills of current aerospace employees to make them more promotable; and bring together high schools, four-year colleges (San Diego State University), and companies (especially Rohr Industries) through Southwestern Community College. The project planned to serve three groups: local high school students, existing SWCC students and persons not employed in the aerospace industry, and industry upgrade trainees (employees). There were four major program components: recruitment, assessment and placement in appropriate educational/training program, training (basic educational skills, core aerospace skills, and advanced technical skills), and student/trainee support services and job placement.

As delivered, this project appeared to provide some services to a number of different groups, but there was little relationship among the services. Each of the three target groups received some service. It is hard to determine which services the project initiated from scratch and which were added to services, such as mentoring, tutoring, and counseling, already offered at SWCC. The thread that appeared to run through the overall effort was an attempt to reform instruction (or build capacity) at SWCC.

The downturn in defense procurements wiped out the growing need for aerospace employees at all levels. Rohr Industries, slated to be the primary partner, laid off one-third of its employees. The Rohr employee who was to be the full-time industry liaison for the project lost his job. In addition, the project encountered problems in staffing. The proposed project coordinator could not wait for an uncertain grant. It took five months to find a new coordinator.

Despite these problems, the project did accomplish several objectives. It carried out tutoring, curriculum development, revision of the engineering technician and engineering transfer programs, developed workshops, placed interns, and linked the institution to NovaNet, a system that allows students access to thousands of interactive, educational software packages, many of which teach remedial math and science. The project coordinator was able to establish limited partnerships with other companies.

- Tutoring. The project supported after-school tutors in high school math and science during the 1990-91 school year. The project estimates that 250 students received some tutoring.

- Mentoring. Forty-one SWCC and 17 high school students were contacted by and/or participated in a mentoring program sponsored by the campus' chapter of the Society of Hispanic Professional Engineers (SHPE).

- Competency-Based Instruction. Ninety-eight SWCC students participated in classes in which instructors had received stipends for curriculum development aimed at making the courses competency based.

- Career Counseling. Twenty-six SWCC students attended job placement workshops, 16 produced resumes, 30 attended a Careers in Engineering workshop, 87 attended a career counseling overview session, and 44 obtained one-on-one counseling session at the Career Center on campus.

- Remediation. The project installed five terminals on the NovaNet system. Approximately 100 students used the remedial software. A number of SWCC students improved their scores on an algebra readiness test after working on the NovaNet remediation system.

- Internships. Despite the downturn in the local aerospace industry and the general economy, the project coordinator was able to place several students in internships at local companies. Six summer positions were developed in 1991. There are currently 11 industry requests for 1992.

- Classes at Rohr. Five SWCC classes were held at Rohr for Rohr employees. A total of 87 employees participated. In addition, 55 Rohr employees received some counseling, and 14 used NovaNet.

As for the high-technology focus, the project planned to train students and workers with varying skill levels to work in the aerospace industry. Courses already available at SWCC dealt with manufacturing engineering, computer-aided manufacturing, industrial engineering, and quality engineering.

Given the extremely local nature of the services and the difficulties this project encountered, it is not clear what elements are exportable to other sites. Some of the curricula developed at SWCC may be usable by others, and other institutions may want to look into SWCC's experience with the NovaNet remediation system.

State Center Community College District
Fresno, California

State Center Community College received a Cooperative Demonstration grant of $399,000 to establish an Advanced Technology Center and provide high technology manufacturing training to disadvantaged populations. The proposal envisioned the development of an Advanced Technology Center (ATC), complete with new facilities and curricula, located in downtown Fresno. The ATC would recruit local unemployed, disadvantaged, and refugee populations through social service agencies and train them in high-tech skills needed by area manufacturers. Courses were to cover topics such as Industrial Controls, Hazardous Materials, Management of Manufacturing Processes, Just In Time (JIT) Inventory Controls, Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) and NC Programming. Courses were to be taught in short but intense modules (9 weeks, 20 hours per week). After completing the courses, trainees were to be placed in three-month internships at companies represented on the project advisory board. The project would create a Manufacturing Technician Certificate Program and establish an articulation agreement with California State University at Fresno. After the project, the ATC would serve primarily as a short-term technical training center for the employees of local manufacturers.

As delivered, the project established an ATC and developed curricula in Hazardous Materials, Computer Assisted Design (CAD), Computer Automated Manufacturing (CAM), and industrial electronics (including the operation of programmable logic controllers). The ATC is located on the campus of Fresno Community College, rather than downtown, because the promised warehouse space never materialized. Furthermore, there has been little training of unemployed or disadvantaged populations. According to project staff, representatives of companies on the Advisory Board insisted on levels of training beyond what could be handled by most disadvantaged students. Most of the training went to employees of local manufacturers. The ATC (both the facility and the curricula) were incorporated into the college's Industrial-Tech. Department at project end.

This project had several accomplishments: it acquired a wide range of high tech equipment for training at the ATC, it gave instructors support to develop and deliver the ATC curricula, and it strengthened the college's relationships with local manufacturers by allowing them to play a role in curriculum development and by training their employees (with grant funds).

Much of the training provided by the project was equipment- or software-specific. For example, students/employees took a class to learn how to operate a particular piece of equipment, such as a programmable logic controller (PLC). The original design of the classes as nine-week modules required this high level of specificity. In several classes, however, this nine-week design was changed. In the Hazardous Materials classes, the nine-week time period was simply too short to learn about all the different materials and regulations. In reality, the classes became more like normal college classes -- 3 hours a week for 18 weeks (one semester). According to project staff, the scheduling of the classes was often determined by the company representatives on the advisory boards, and was designed to match up with the workshifts at local companies. For instance, PLC classes were taught in the early morning so that employees could attend before work.

In several of the classes, such as PLC and CAD, instructors discovered mid-way through a course that a number of students/employees lacked the basic math and electronic skills necessary to complete the class. The instructors had to stop teaching the specific skill (equipment or software) and teach the basics. (Several industrial electricians did not know what ohms and amperes measured, and several drafting students were not proficient in trigonometry.)

As part of the incorporation of the ATC into the college's Industrial-Tech department, the college is working to develop a broader two-year certificate program in Advanced Technology. All students in this program will take core classes in math and electronics, then select a specialty in Hazardous Materials, industrial electronics, or CAD/CAM.

A total of 124 persons received training. Of these, 98 were current employees of companies. A wide variety of courses were offered, including CNC control (first class 20 hours, second class 45 hours--24 students registered and 22 completed), Basic Programmable Mill (first class--20 hours, second class 45 hours--18 students registered and completed training), CNC Manual Programming (1 class, 8 students, 90 hours of training), Tool Design (1 class, 8 students, 90 hours of training), Basic Programmable Lathe (7 students, 45 hours), CNC Programming (9 students, 45 hours of training), Intro. to Hazardous Materials (2 courses, 54 hours each, 14 students each), and Industrial Hazardous Waste Treatment (2 courses, 54 hours each, a total of 16 students).

As for exportability of what was learned in this project to other sites, the original proposal noted that as of February 1989, 41 ATCs had been established in 18 states. The project director pointed out that most these ATCs are in hard-hit industrial areas. Fresno is largely an agricultural area, where the potential users of high-technology equipment are in food-related industries such as processing and packaging plants. The establishment of the ATC is also part of an effort to attract non-agricultural industry to Fresno.

Waubonsee Community College
Sugar Grove, Illinois

The office technology program, "Survival Skills for Office Technicians", has been operating at Waubonsee Community College (WCC) since the late 1970s and has been supported by a variety of public funding sources. The program has been distinct from the regular, for-credit office careers training at WCC both in sources of funding and philosophy of operation. Where postsecondary students would pay to enroll in office careers classes and receive instruction in a traditional classroom structure, students in the office technology program had their training costs paid by another agency and worked at their own pace. The program also was distinct from the customized training offered to local employers. Prior to WCC's first Cooperative Demonstration grant in FY1988, most of the noncredit office technology training was supported by CETA and, Job Training Partnership Act (JTPA) funds through the Kane-DeKalb County Private Industry Council (KDC-PIC).

WCC used its first Cooperative Demonstration grant to provide basic skills assessment, training, and job placement to 208 minority or disadvantaged women. The first grant provided training in basic keyboarding, filing, bookkeeping, switchboard operation, office decorum, database management, word processing, and electronic spreadsheets. The second grant (FY1989) added training in Unix-based software (SAMNA and Lotus), electronic mail, electronic shorthand, fax, and desktop publishing. The second grant also enabled the instructors to place more emphasis or computers. For example, the typing course went from using manual typewriters to computers, and the filing course went from using a manual file box to a computerized filing system.

Under both grants, classes were held at WCC's downtown Aurora campus from 8:30 a.m. to 4:00 p.m. Monday through Friday (with two 15-minute breaks) to simulate the actual office schedules. Evening hours were added during the first grant period to accommodate those people already working, but students had to commit to at least 12 hours of instruction per week. The program is continuing in its entirety after the end of the grant.

Although the "Survival Skills for Office Technicians" program is an outgrowth of an existing program for JTPA clients, students are eligible for training only if they are not eligible for JTPA. The exclusion of JTPA clients is in part to satisfy concerns of the KDC-PIC about competing for clients, but also in part specifically to serve those women not being served by JTPA. For example, WCC was aware of widows and divorcees who would have had to sell their houses in order to be eligible for JTPA. The grant was designed to assist these women as well as others with no family income or assets. Child care was provided on campus and paid for by the project if necessary. Approximately 94 percent of the people trained under the second grant were women and 49 percent were minorities; 24 percent were unemployed at the time of training.

Students were referred to the program through private employment agencies, partner organizations, and the WCC counseling office. Project staff advertised the program and classes through church groups, the Urban League, the local Migrant Council, and other community-based organizations; staff were approached by a prison-release program to include those clients, as well. Students admitted to the program had to have a minimum of a 10th grade reading/comprehension level and a GED or high school diploma or be in a GED class. Basic skills levels were assessed through ASSET tests given by the college's assessment center. There also was a two-day assessment in the Office Technology Department for pretests in math, English, spelling, filing, and typing.

The partners in the grant were companies that had either referred individuals to the program in the past or who had hired people trained by the program. For example, one of the 12 partners was the Illinois Department of Employment Security (IDES), which referred people filing for unemployment to WCC for retraining. The project director would certify to the IDES those students being trained each week so the students could continue to collect benefits. Another partner was the Kane County Circuit Court which had hired students from the program in the past. A third partner was the Kane County Department of Public Aid, which both referred people to the program under its own "Project Chance" and which hired graduates of the program. There were no formal partnership agreements between WCC and the private groups, and the project had no formal advisory board of partners.

The program included an unpaid work-experience component for those students who could type 30 words per minute and who had some word processing skills. Approximately 15 percent to 20 percent of the students were placed in internships at any one time. The project director arranged for placements in the partner organizations.

All of the seven project staff members were part-time (35 hours/week) employees of WCC and all were paid entirely from grant funds. As part-time employees, staff received no fringe benefits other than retirement. The lack of benefits made it difficult for the project to attract and hire staff. This lack of benefits made staff members even more aware of the importance of placing students in jobs with benefits. Consequently, the staff made an extra effort to find students jobs with public agencies.

Of the 40 courses offered by the program, 15 were new courses during the second Cooperative Demonstration grant. The new courses were on subjects either suggested by partner organizations (e.g., customer service) or by student feedback on their work experience (e.g., proofreading). The new courses were developed by project staff using commercially available products (e.g., a proofreading curriculum package) or from portions of software manuals and supplementary texts. The office telecommunications course was developed by an intern from Indiana University, who was paid only for her teaching time but who received college credit for developing the course. The staff purposely did not look at courses from the other colleges because the staff felt that the students being trained needed an approach different from that used in for-credit courses.

The open-entrance\open-exit and self-paced structure for the training are available for export but are not well documented. Copies of curriculum packages are available to other institutions upon request. Northern Illinois University has implemented the packages for WordPerfect, keyboarding and data entry, and customer service. Two local school districts are reviewing the packages for possible use.

The project director has arranged for three articles about the project in the local newspaper and appeared on two TV shows. The newsletter for all Cooperative Demonstration grantees that was started under the first grant was discontinued after four issues in the second grant.

West Virginia Northern Community College
Wheeling, West Virginia

West Virginia Northern Community College (WVNCC) is a two-year college located in Wheeling, West Virginia, with three branch campuses, including one in Weirton. Weirton, in the heart of steel and coal country, is the home of Weirton Steel Corporation, the seventh largest steel company and the only employee-owned steel firm in the United States. Twenty percent of all Weirton residents work in the steel mill.

The partnership goals were to develop a curriculum and provide upgraded training for current plant workers. The training included high-technology computer education for workers that would enable them to operate a new data collection system at the plant. Training also would include craft instruction in high-tech skills for pipefitters and millwrights so they could operate new, automated equipment for hot strip mill renovation at Weirton.

The new data collection system that became the focus of the training was the Integrated Mill Information System (IMIS), purchased from Computer Services Corporation. IMIS was purchased to better track products being manufactured in the mill and more quickly ascertain their production status in order to enhance customer service. Due to problems in implementing IMIS, plans changed from training plant workers to conduct statistical and other advanced analyses to training them in data entry and initial computer orientation. Although the training program was essential for workers to learn IMIS, similar training with newly implemented information systems typically is conducted by the vendor.

Classroom training took place at three-hour sessions for three days at Weirton Steel's classroom facilities, after regular work hours. One crew (per mill operating unit) was trained at a time. Employees received on-the-job-training for about two weeks, although more was available if needed. Weirton Steel compensated all 1,200 employees who received IMIS training in the form of five hours of vacation time for every three hours of classroom training, as well as free meal tickets.

Curriculum development was a major undertaking but an essential part of the work of this program. Forty-four curriculum modules were developed for IMIS training, one module for each machine at Weirton Steel. Staff development also was extensive. Trainers were carefully screened and, when hired, trained for 40 hours a week for six weeks.

The craft training component of the grant was a much smaller dimension than originally specified in the proposal. Workers in the hot mill were vendor-trained, with WVNCC trainers playing only a minimal role. Craft training was given to 389 hot mill workers. Topics of craft instruction were hydraulics, lubrication, shaft alignment, welding, pipefitting, and scaffolding. Classes were offered for eight-hour sessions during the work week. To complete the 200-hour craft training program, employees attended class 40 hours per week for five consecutive weeks.

The relationship between WVNCC and Weirton Steel was not a new one. They had already formed a partnership in 1987 for the Workplace 2000 Workplace Literacy Program. This training program was a new one, however, and in order to run it seven full-time and five part-time trainers were hired. Also user support team and plant floor support team members--all Weirton Steel employees--facilitated on-the-job use of classroom learning.

Dissemination activities included a national teleconference called "Education: Bridging the Gap," which included topics such as the business/industry partnership, employees' fear of change, and assessing training effectiveness. WVNCC staff made presentations in Florida--at the Leadership in Education conference, Florida State University's national conference, and in California--at the International Conference for the Council for Adult and Experiential Learning.

Fox Valley Technical College
Appleton, Wisconsin

Fox Valley Technical College (FVTC), located in Appleton, Wisconsin, offers 59 associate degree and vocational programs to more than 5,000 students, as well as contracted training to approximately 17,000 local industry employees per year. Appleton is in a part of Wisconsin that is highly oriented to manufacturing.

The goals of the Computer-Integrated Manufacturing Program (CIM) were to demonstrate a cooperative approach to provide training and technical assistance in CIM to local manufacturers and develop a model that could be used by other postsecondary educational institutions.

The specific goals of the CIM program, as stated in the proposal, were to provide: 1) Orientation to CIM for small businesses through a college-wide CIMulation Laboratory; 2) Cost-effective training in CIM via a quality approach to instruction; and 3) Comprehensive, yet affordable, support in CIM planning and implementation from an expert, faculty-student technical assistance team.

The first steps needed to carry out these goals were to increase the client base and market CIM. To that end, individual instructors reached out to industry. Also, the CIM Solution Demonstration (CSD), a storybook demonstration on computer, referred to as the CIMulation laboratory in the proposal, was instrumental in promoting marketing. It was put into place with Cooperative Demonstration grant funds.

The CSD shows how a small manufacturing company uses the technologies of an integrated system to improve its management, operation, and responsiveness. The live demonstration tracks an engineering change from a request for quotation to the shop floor where a prototype part will be cut to meet a customer's specifications. All departments -- such as management, operations, and production -- explain their role in this engineering change, and the demonstration concluded with a final quotation being printed for the customer. Conversion to CIM technology for this company resulted in improved response time and an improved market share. Every Thursday, businesses interested in CIM were given two-hour tours through the CSD. To increase local business exposure to the CIM Solution Demonstration, a student phoned local businesses to invite them to the demonstration, a practice which continues. FVTC used grant money to supplement the cost of training as an incentive to get companies to participate in CIM. CIM training usually was held on the campus of FVTC at the Bordini Center, which was especially built to provide corporate training and is a symbol of FVTC's commitment to industry. This arrangement was preferred to on-site training because there would be fewer interruptions, but in some cases on-site training was essential because specialized equipment was only available there. Once CIM was implemented on-site, a CIM instructor would spend time at the company making sure implementation was complete.

Not only was the CIM curriculum offered to companies, it was also integrated into other FVTC degree programs, such as accounting, data processing, and printing and publishing. Approximately 1,300 students at FVTC completed a course that was infused with a CIM curriculum component, and 216 persons already employed by business and industry completed training.

Prior to the grant, Fox Valley entered into a relationship with IBM, its partner, because the college was chosen by IBM to become a member of the CIM Alliance. The CIM Alliance is an alliance of 70 colleges and universities throughout the United States that are active in CIM technology. The CIM Alliance allowed Fox Valley to exchange technology and develop CIM curriculum. IBM donated computers and computer programs.

There was a small change in strategy from what was proposed in the application to what actually happened with CIM training. One goal of the project was to put together a team of instructors to go out into industry and offer a CIM system that effected the whole company. This has not worked well, however, because area companies would rather undergo piecemeal change rather than company-wide change. Therefore, CIM training more typically takes place using one particular application, such as CAD to CAM, using AutoCAD software. By taking on these small CIM application training sessions, CIM instructors hope to spread the word about CIM availability and the possibility of company-wide change.

The third-party evaluation was particularly valuable to the CIM staff, causing them to institute some changes that worked to the benefit of the program. The strengths of the FVTC program identified by the evaluator included: 1) FVTC is truly operating a CIM system. The evaluator had seen many CIM systems, but this is the first one that really combines all major components of CIM, such as managerial, technical and manufacturing, and engineering; 2) Institutional and local support for the program were great; and 3) Interest and abilities of participating staff were great.

One recommendation that the evaluator made during the first evaluation site visit was that communication among project staff members be improved. There needed to be more of an understanding of all of the components of CIM.

Communication had improved by the time of the evaluator's second visit. For instance, business instructors were using shop floor language and vice versa.

Dissemination has taken place on a variety of levels. Videos were produced with grant funds that explain CIM in several different ways. One video is of the overall CIM program, and all subsequent videos explain CIM's application in business, design, publishing, and manufacturing. Presentations about the CIM program were also made at a Leadership 2000 seminar and a Society of Manufacturing Engineers conference in Chicago. Also, a CIM Breakfast, at which one of the CIM videos was shown, was held for 100 local business people, politicians, and the press.

West Virginia Department of Education
Charleston, West Virginia

The West Virginia Department of Education, Bureau of Vocational, Technical, and Adult Education is located in Charleston, West Virginia. This grant was unique in that the grantee oversaw two training programs offered by separate vocational centers within the state: the Marion County Vocational-Technical Center and Carver Career and Technical Education Center. These programs, which were implemented as a result of the Cooperative Demonstration grant, involved training in two different technology areas: health and computers. The grant programs were located in Charleston and Fairmont, West Virginia, about two hours apart by car. Roy Thomas was the overall project director and coordinator, and there were local project directors at each site.

Specific objectives of the project, as stated in the proposal, were to:

- Implement cooperative training programs in the occupational areas of ADA computer language use, respiratory therapy, and hospital pharmacy technician;
- Train or retrain the unemployed, the underemployed or other adults who need upgraded skills in these technical areas;
- Place 80 percent of the trainees in jobs for which they have been trained at the end of the project;
- Identify, develop, or adapt instructional materials for program use;
- Produce process and evaluative reports at the end of the project; and
- Disseminate project activities and results on a State and national level.

Marion County Technical Center (MCTC), located in Fairmont, West Virginia, developed and administered the ADA computer language program. This program became a part of MCTC's existing robotics/automated technology program. An extensive curriculum, "A Secondary/ Postsecondary Curriculum for the ADA Programming Language" was developed as part of the grant. The curriculum as originally proposed would serve only adult technical students and industry personnel; however, as developed, it serves secondary students as well.

Another change in the original plan for this program was the insufficient knowledge-base of members of local industry. They had to be taught the value of ADA if the training was to have any value to them. Their lack of familiarity with DOS was a hindrance to using ADA. Program staff, therefore, taught "DOS for Managers" and developed a manual to accompany the training workshop.

Marion County teamed with J&S Machine Corporation, which donated equipment and acted as a liaison to local industry. Ties with West Virginia University and Fairmont University, which assisted in ADA language curriculum development, also were established. Four business and industry workshops were taught during the project, two ADA workshops were held for teachers across the State, and one ADA teleconference for teachers also was held at Fairmont State University.

ADA courses offered at MCTC were held for 18 six-hour sessions during a six-month period. The ADA program, which employed one new teacher who also was the main curriculum developer, proposed to serve 10 students at MCTC and 10 business and industry personnel. This goal was met, although training provided to 34 business and industry workers was not in ADA as originally proposed, but in other computer technologies and computer-assisted drafting and manufacturing. ADA in-service training, however, was provided to 30 teachers. Eight students completed the MCTC training.

Carver Career Center developed pharmacy technician and respiratory therapy technician training programs. The idea for these programs was already in motion, although actual partnership had not begun prior to the grant. Carver teamed with six health care providers, including the Charleston Area Medical Center (CAMC), which donated equipment and staff to serve on the advisory board. Existing curricula--from the California College for Health Sciences and the Michigan Pharmacists Association--were adopted with minor adaptations. A library and laboratory were set up at Carver for the respiratory therapy program, and Carver has an application pending for national certification of this program as well as State certification for the pharmacy technician program.

An eleven month instructional program was conducted for the respiratory therapy program, which consisted of both classroom and clinical experiences. Students in the pharmacy program chose one of two five-and-a-half month training programs, which also involved classroom as well as clinical components.

The goal for the respiratory program, which employed two new teachers, was to train 30 students. Thirty-four students enrolled, and 24 of them completed the program. The goal for the pharmacy program, which employed one new teacher, also was to train 30 students. Twenty-nine students were enrolled, and 23 completed the program.

Dissemination activities of the grant included one television report and five newspaper articles. ADA workshops and curriculum guides, as mentioned above, contributed significantly to successful dissemination practices. The Carver Career and Technical Center staff developed and distributed recruitment and promotion brochures of the health care programs. Roy Thomas made presentations at conferences of the National Association of State Directors of Vocational Education, the American Vocational Association Conference, and at the annual conference of the National Association for Program Improvement in Vocational Education. Copies of the final report and all curriculum materials are being presented to all vocational directors in West Virginia as well as to the National Center for Research in Vocational Education, the ERIC system, the East Central Curriculum Center, and the

West Virginia Curriculum Center. Copies of the final report are being distributed to all State directors of vocational education.

Appendix F

SUMMARY OF SURVEY OF FY1989 PROJECTS

SUMMARY OF SURVEY OF FY1989 PROJECTS

This appendix presents detailed findings from a survey of the FY1989 grantees under the Cooperative Demonstration Program (High Technology) of the 1984 Carl D. Perkins Act. All 30 FY1989 grantees were sent the survey, and, as of November 1991, responses (including telephone data retrieval) were obtained from 26 grantees. The grantees responding to the survey are identifed with an asterisk on the list of FY1989 grantees presented in Appendix B-2. In general, respondents were the individuals responsible for day-to-day management of the project. Although 26 grantees returned questionnaires, results reported here usually total 27 because one grantee was a state education agency that, in turn, dispensed the funds to two, unrelated, projects.

The survey was designed to collect information on project implementation, especially factors related to startup, goals, major activities, partner involvement, and levels and types of services. Survey questions pertaining to project costs were discussed in the cost-benefit analysis in Section IV. Many of the survey questions were generated from findings of case studies in eight FY1988 grantees visited during the 1990-91 school year. In addition to describing programs, the questionnaire was designed to provide a framework for subsequent site visits.

Instructions for the survey were distributed in stages to respondents. In early February 1991, all project directors received a detailed memorandum from the Office of Vocational and Adult Education (OVAE) indicating the information about clients, staffing and extent of training that would be requested in the questionnaire. The memo was followed by phone calls from the study team to all grantees over the next month to reiterate the need to obtain the data and to answer any questions grantees might have about the memo. The survey was mailed to grantees in July 1991, and telephone calls were made to obtain responses continued throughout the summer and fall.

Despite the early memo and phone calls, and repeated telephone follow-ups to the survey mailing, only 26 of the 30 grantees returned questionnaires, and about one-third of the respondents provided incomplete systematic information.[1] As a result, it is not possible to provide findings for the course completion and student outcome data requested by the survey. To facilitate the narrative discussion, simple frequencies are not presented as tables in the text.

Training Areas

The legislation mandating the Cooperative Demonstration Program allowed for projects in a wide range of industries, but most of the projects that were funded under the demonstration offered training in a few industries. Manufacturing was the most common industry focus, although health care and business services also were training areas (see questionnaire, item 7). Seventeen of the respondents reported manufacturing to be an area in which students were trained, seven projects indicated health care to be an area of training, and five reported a business services focus. Seven respondents indicated that training took place in multiple industries, and to specify a few industries would be misleading.[2]

Projects were divided almost equally between those that saw training of students to be their "key" activity and those that chose various activities associated with the development of the training to be most important (see questionnaire, item 6). Thirteen grantees identified student training itself to be the most important project activity, while five selected job skills identification, and five selected curriculum development as the dominant activity. Student recruitment, staff development, industry/occupational change, and institutional capacity building each were selected by one respondent.

All projects provided occupation-specific training, and the majority (16 of 27) provided non-occupation-specific training as well (see questionnaire, items 26 and 31). The most common forms of non-occupation-specific training were provision of employability skills (13 projects), provision of basic academic skills, (11 projects), and provision of advanced academic skills (nine projects).

Offerings were designed to teach both entry level and more advanced skills (see questionnaire, item 8). Although eight grantees reported that training was geared entirely to entry-level work and five reported that it was geared entirely to upgrading skills, 14 grantees reported that training was designed for both. Grantees providing training in health care were slightly more likely to emphasize entry-level skills and slightly less likely to emphasize upgrading or both types than other grantees. None of the programs training in business subjects taught entry-level skills entirely (see Table F-1).

Overall, projects were somewhat more likely to be stand-alone efforts than parts of existing training programs at grantee institutions (see questionnaire, item 9). Eight grantees indicated that their projects were part of ongoing training efforts, while 14 indicated that the grants supported separate training programs. An additional five grantees described their efforts as both stand alone and parts of ongoing training programs.[3] Projects training in construction, manufacturing, or multiple industries were somewhat more likely than those training in other fields to be separate from regular institutional offerings (see Table F-2). Ten of the 17 programs that indicated manufacturing as an area of training also indicated that the training was separate from other offerings at the institution.

Although they may not have been tied to ongoing offerings, projects were likely to serve groups that previously had been served by the institution (see questionnaire, item 10). Only five grantees reported that the project served a new or different group exclusively, and eight indicated that the project was intended to benefit groups similar to those served previously. Fourteen projects indicated that both new and similar groups benefitted. Projects training in business services were the most likely to indicate that new groups benefitted exclusively (see Table F-3). Projects that provided training in health care were the most likely to indicate that groups similar to those served previously were served through this project.

Projects characterized the likely "rewards" of training for participants as occupational in nature (see questionnaire, item 65). According to the grantees, the most common student reward was likely to be a job in a particular field (22 projects). Beyond that choice,

Table F-1

MAJOR INDUSTRIES OF TRAINING AND SKILL LEVEL OF TRAINING PROVIDED (NUMBER OF PROJECTS)

Industry[◆]	Number of Projects[•]	Entry-level Skills	Upgrade Skills	Both
Construction	4	0	1	3
Manufacturing	17	3	3	11
Business Services	5	0	1	4
Health Care	7	3	1	3
Education	4	1	1	2
Multiple Industries	7	0	2	5

[◆] Industries with fewer than four responses omitted from analysis.

[•] Adds to more than 27 because projects could select more than one industry.

Table F-2

MAIN INDUSTRIES AND PLACEMENT OF PROJECT WITHIN GRANTEE INSTITUTION (NUMBER OF PROJECTS)

Industry*	Number of Projects*	Addition to Ongoing Training	Separate Training Program	Both
Construction	4	0	4	0
Manufacturing	17	3	10	4
Transportation	4	1	2	1
Business Services	5	2	1	2
Health Care	7	2	4	1
Education	4	2	2	0
Multiple Industries	7	1	5	1

* Industries with fewer than four responses omitted.
* Adds to more than 27 because projects could select more than one industry.

Table F-3

MAIN INDUSTRIES AND SERVICE TO NEW OR SIMILAR INSTITUTIONAL CLIENTELES (NUMBER OF PROJECTS)

		Project Benefits		
Industry[◆]	Number of Projects[•]	New or Different Group	Similar Group to Previously Served	Both
Construction	4	1	2	1
Manufacturing	17	4	2	11
Transportation	4	1	0	3
Business Services	5	2	1	2
Health Care	7	2	4	1
Education	4	1	1	2
Multiple Industries	7	2	1	4

[◆] Industries with fewer than four responses omitted.

[•] Adds to more than 27 because projects could select more than one industry.

however, the most commonly given response was not on the questionnaire. Nineteen respondents wrote in responses that identified some form of behavioral training objective--most saying that students would be able to perform a particular set of occupational skills. Promotions in a particular field or with a particular employer were anticipated by 17 and 15 projects respectively. Formal education credentials were somewhat less popular possible student rewards, with 14 projects anticipating vocational certificates, and 11 each selecting a degree/diploma or acceptance into further education.

From an open-ended question on project beneficiaries, the study team organized projects by several primary types or classes of participants. These types were not mutually exclusive but were intended as general characterizations of project clienteles. They included: current employees of companies (13 projects), adults seeking work in a field or company (seven projects), disadvantaged adults (four projects) and high school students (three projects). For six projects, a second-level client was also characterized. Two of these projects indicated that second-level beneficiaries included regular college students, two indicated high school students, and one each indicated schoolteachers or disadvantaged persons. Two projects also identified a third type of client.

Projects providing training in manufacturing were the most likely to indicate current employees as their primary clientele (see Table F-4). Fifty-nine percent (or 10 of 17) of such projects indicated that current employees were their primary clients. Programs providing training in multiple industries also indicated that they served existing employees primarily (four of seven, or 57 percent). Projects providing health care training were more likely to indicate that they served adults seeking work in a field or company (three of seven), which fits with the earlier finding that such projects were somewhat more likely than others to provide entry-level training exclusively.

Table F-4

MAIN INDUSTRIES AND PRIMARY CLIENTELE[*]
(NUMBER OF PROJECTS)

Industry[*]	Number of Projects[*]	Current Employees	Adults Feeling Work in Field or Company	Disadvantaged Persons	High School Students
Construction	4	2	1	1	0
Manufacturing	17	10	3	3	1
Transportation	4	0	1	2	1
Business Services	5	1	1	2	1
Health Care	7	1	3	2	1
Education	4	3	0	1	0
Multiple Industries	7	4	2	1	0

[*] Categories derived from open-ended question. Industries with fewer than four responses omitted.

[*] Adds to more than 27 because projects could select more than one industry.

Only one project providing health care indicated that it served current employees of companies. Projects offering training in business services were somewhat more likely than others to indicated that they served disadvantaged adults (two of five projects).[4]

Projects training for manufacturing and multiple industries were also more likely to train persons employed full time (see Table F-5). Although information on employment status of clientele was not available for all such projects, of the 16 projects training students in manufacturing for which data exist, seven indicated that 76 percent to 100 percent of students were employed full time, and an additional three indicated full-time employment by 51 percent to 75 percent of students. In contrast, none of the six projects providing training in health care for which information is available indicated that 76 percent to 100 percent of students were working full-time, and only one indicated that 51 percent to 75 percent were working full-time.

From these findings, then, a rough pattern of projects begins to emerge. The most common offerings appear to be in the area of manufacturing. Training provided under the grant is relatively separate from regular offerings at the same institutions; the clientele typically is current employees (most likely full- or part-time employees in the fields to which the project is geared); and this population (current employees) is one that the institution has served previously. Training appears to be geared to achieving mastery of a specific set of occupational skills more than to obtaining formal credentials.

Economic Conditions and Effects on Projects

From reviewing the project files and the site visits to FY1988 grantees, the study team anticipated that training aimed at jobs or promotions would be a major part of grantee activities. Project proposals often included job placement goals for participants, so the ability to find jobs for trainees would be of paramount importance. As a result, the questionnaire asked grantees about the economic climate in the communities in which they were located as well as in the specific fields for which training was provided.

Table F-5

MAIN INDUSTRIES AND CLIENTELE EMPLOYMENT STATUS DURING TRAINING (NUMBER OF PROJECTS IN WHICH INDICATED PERCENTAGE OF PARTICIPANTS WERE EMPLOYED FULL TIME DURING PROJECT)

Industry *	Number of Projects *	0%	1-25%	26-50%	51-75%	76-100%
Construction	4	0	0	1	2	1
Manufacturing	16	1	2	3	3	7
Transportation	4	1	0	2	1	0
Business Services	5	1	1	2	0	0
Health Care	6	2	0	3	1	0
Education	3	0	0	1	0	2
Multiple Industries	7	0	1	1	2	3

* Industries with fewer than four responses omitted.

* Projects on Manufacturing, Health Care and Education are each one fewer here because of missing data.

Grantees indicated that economic conditions in their communities had deteriorated since they applied for grants (mid-1990), but few indicated that the changes had affected implementation of the grant (see questionnaire, items 1 and 2). About half the grantees (14) indicated that economic conditions in the community had deteriorated, and 11 grantees indicated that conditions remained about the same throughout the period. Yet when asked whether the decline had affected grant implementation (e.g., did it mean fewer jobs for students or problems for the institution?), only 10 of the 14 indicated an effect. Four said that the changes had resulted in fewer jobs for students, and four indicated that the changes resulted in problems for the institution.

Grantees were slightly less likely to indicate that a decline in economic conditions in the specific industry or occupation in which training was provided had affected project operations (see questionnaire, items 3 and 4). Well over half the respondents (16) indicated deteriorating economic conditions in the specific fields of training, but only half of those indicating a negative economic change also reported that it affected project operations. Six of these cited poorer job prospects for students as an outcome, while three indicated a negative effect on the institution. Two grantees reported that negative changes in the industry created a positive opportunity for the project by increasing training needs, and one grantee indicated that better economic conditions in the industry led to fewer training opportunities at the institution. These last responses may reflect a common finding that bad economic times, although creating poor job prospects, can sometimes translate into increased enrollment in training programs. Not only do the unemployed seek training, but persons who are concerned about losing their jobs may also enroll.

Deteriorating economic conditions appear to have been most common among the projects that provided training in manufacturing (see Table F-6). Among the grantees, 71 percent of those that provided training in manufacturing reported that economic conditions in the industry of training had deteriorated since the grant application. Among those grantees providing training in health care, only 29 percent reported

Table F-6

MAIN INDUSTRIES AND LIKELIHOOD OF ECONOMIC CHANGE OVER PAST TWO YEARS (NUMBER OF PROJECTS REPORTING)

		Industry Conditions		
Industry[*]	Number of Projects[•]	Improved	Deteriorated	Remained the Same
Construction	4	0	1	3
Manufacturing	17	2	12	3
Transportation	4	0	2	2
Business Services	5	1	2	2
Health Care	7	1	2	4
Education		0	2	2
Multiple Industries	7	1	4	2

[*] Industries with fewer than four responses omitted from analysis.
[•] Adds to more than 27 because projects could select more than one industry.

deterioration, while among those providing business services, 40 percent indicated economic deterioration in the industry. Because the individuals enrolled in projects offering manufacturing training were the most likely to be full-time workers (see Table F-5), however, the economic deterioration may not have translated into immediate job effects.

Project Goals and High-Tech Focus

In the first year of the evaluation, site visits revealed that grantees had a wide variety of goals, with a substantial subset of grantees concerned as much with curriculum, staff, or institutional development as with the direct provision of training. For FY1989 grantees, there was a major change in Federal direction: only applicants promising a "high-technology" training focus were considered for awards. It was thought that this constraint might narrow the range of project goals, so several questions were included in the survey in an attempt to understand the relative importance of training and other goals as well as the nature of the "high-tech" focus itself.

Once again, the grantees expressed a wide variety of goals. For the FY1989 grantees, provision of training was the single most important goal, but almost half the respondents selected another goal as most important (see questionnaire, item 5 and Table F-7). Of the 27 respondents, 15 indicated that creating new or improved training was the first goal. An additional seven grantees reported that increasing access to training for special or otherwise underserved populations was most important (see Table F-8). Given the overall Federal objective to develop models of public/private cooperation, it was surprising that the establishment of partnerships was ranked first by only three respondents. Improving economic productivity was the primary goal of two grantees.[5]

The distinction between the projects with a training focus and those with other emphases appeared to persist as projects selected second ranked goals. Of the 12 grantees that did not select training as the first goal, only three selected it as second. Grantees that did select training as their primary goal selected the goal of increased

Table F-7

RANKING OF PROJECT GOALS

Project Name	Project Goals Increase Access	 Establish Partner	 Improve Training	 Other
Alabama Aviation College	2		1	
Ben Hill-Irwin Institute		2	1	
Bronx Community College	1	2		
CORD	2		1	
Clackamas Community College	2	1		
Columbia Basin College		2	1	
Fox Valley Tech		2	1	
Hampden County Consortium	1		2	
Home Builders Institute	2		1	
Howard Community College	2		1	
Illinois Eastern College		2	1	
Indian Hills College	1	2		
John M. Patterson College		2	1	
LTV Steel Co.		2		1
Luzerne Community College	1		2	
Nebraska Labor Department	2	1		
North Clackamas Schools		2	1	
Northampton Community College		2	1	
PAVE		1		2
State Center College District	2		1	
Valencia Community College (Health)		2	1	
Valencia Community College (Tele)	1	2		
Valencia Community College (CIM)	1	2		
Waubonsee Community College	1		2	
West Virginia Northern College		2	1	
West Virginia Department of Education 1		2	1	
West Virginia Department of Education 2		2	1	

Table F-8

PROJECTS' PRIMARY GOAL AND KEY ACTIVITY
(NUMBER OF PROJECTS)

		Primary Goal			
Key Activity	Number of Projects	Increased Access	Improve Training	Establish Partnerships	Economic Development
Student Recruitment	1			1	
Student Training	13	4	6	1	2
Staff Development	1		1		
Identification of Job Skills	5	3	2		
Curriculum Development	5		5		
Other	2		1	1	

access to vocational training for special populations somewhat less as a second goal than did other grantees. Of the 15 that selected training first, only five selected increased access for special populations as their second goal. This group was more likely to choose public/private partnerships second, with 10 making that selection. What these choices suggest is that increased access of special populations was the primary or secondary goal of a distinct subset of projects--those that saw the goal of developing new or improved training as somewhat less important.[6]

Projects that selected new or improved training as their main goal also differed from those that selected increased access in what they considered to be their "key" project activities. Projects that held new or improved training as their most important goal were more likely to view curriculum development as their key project activity (see Table F-8). Of the training projects, five of 15 saw curriculum development as the most important activity. In contrast, among the projects emphasizing increased access of special populations, none saw curriculum development as its most important project activity. The "increased access" programs were more likely to emphasize the training itself as the most important activity--with four of seven making this selection.

As for the meaning of high technology, the projects also reflected different interpretations of the Congressional mandate. Based on case studies of FY1988 grantees, the study team identified four basic ways in which projects incorporated high technology in developing their programs and delivering training. Projects were high-tech if:

- Training was designed to prepare students for jobs in fields that manufacture high-tech products or service high-tech equipment;
- Training was designed to enable students to use high-tech equipment or products even though the field in which the equipment is used is not generally considered high-tech;

- Training was conducted on high-tech equipment, such as computers, CAD, or CIM equipment; or
- Training was offered in basic skills as preparation for specific occupational training in a high-tech field.

In the survey, FY1989 grantees were asked to select all the high-tech definitions appropriate to their projects.

Most grantees selected more than one response to describe their projects' high-tech elements (see questionnaire, item 13). Fourteen projects selected [a], 12 selected [b], 17 selected [c], and 13 selected [d]. To make it possible to analyze these data further, the team observed the overlap between [a] and [b], which asked respondents to select essentially mutually exclusive fields of employment. The study team discovered that there were only three projects that selected both responses, and that a total of 23 projects had selected [a], [b], or [a] and [b]. Of the remaining four projects, one selected [c], two selected [d], and one selected [c] and [d]. The study team reasoned that projects selecting [a] or [b] and also making selections from among [c] or [d] were, in making their [c] and [d] selections, picking activities that occur as a function of training provided in fields described in [a] or [b]. Hence, for these projects the team would concentrate further analysis on the field selection--i.e., [a] or [b]. As a result, the team created one response category for each project for further analysis as follows:

- [a], but not [b]: training for high tech field--11 respondents;
- [b], but not [a]: training for high-tech equipment in non-high tech field--nine respondents;
- [a] and [b]: training for both high tech field and for using high-tech equipment in a non-high-tech field--three respondents;
- [c] only: training on high-tech equipment--one respondent;

- [d] only: basic skills training to prepare for further training in a high-tech field--two respondents; and
- [c] and [d] only: training on high-tech equipment and basic skills training in preparation for further training in a high- tech field--one respondent.[7]

Using these categories, most of the projects (23) defined "high-tech" in terms of the occupation or equipment for which training was provided. Of those projects, about half (the 11 [a]s) were explicitly preparing persons for immediate or specific work in high tech fields. Most of the others (the nine [b]s) were preparing students to use high-tech equipment or products in a non-high-tech field, with the rest doing both. If these answers are indicative, the remaining four projects were not preparing students for explicit high-tech applications, but rather defined their projects' high-tech element in terms of the equipment used in training or the students' long-range occupational goal.

Second, the study team examined more closely the extent to which the 23 projects that defined their high-tech focus in terms of occupation or field application also used high-tech equipment or provided basic skills instruction as part of their activity (see Table F-9). The team found that of the programs that prepared students for work in high-tech fields, the vast majority (eight of 11 under [a] above) used high-tech equipment in training. Among the projects preparing students to use high-tech equipment in non-high-tech fields, however, only a slim majority (five of nine under [b]) conducted training on high-tech equipment. Because these projects were explicitly preparing students to use high-tech equipment or products on the job, the lack of training on such equipment in a majority of them is surprising. It suggests that the training may have been quite limited in scope.

The projects preparing students to use high-tech equipment in non-high-tech settings were also more likely not to offer basic skills

Table F-9

EXTENT TO WHICH PROJECTS THAT PREPARED STUDENTS TO WORK IN HIGH TECH FIELDS OR WITH HIGH TECH EQUIPMENT TRAINED STUDENTS ON HIGH TECH EQUIPMENT OR IN BASIC SKILLS

High Tech Definition of Project	Trained on High Tech Equipment		Target Basic Skills	
	Yes	No	Yes	No
a. Prepared Students for Jobs in Fields Manufacturing or Servicing High Tech Products. (n=11)	8	3	6	5
b. Prepared Students to Use High Tech Products Although Field Was Not High Tech. (n=9)	5	4	2	7
a. and b. (n=3)	2	1	2	1

instruction. Only two of nine such projects indicated basic skills instruction, compared with six of the 11 projects preparing students for jobs in high tech fields. This finding also suggests that the training for use of high-tech equipment in non-high-tech fields may have been rather limited or narrow in scope.

Projects that included manufacturing were considerably more likely than others to be preparing students for work in high-tech fields (see Table F-10). Eleven of 17 projects that indicated preparation for the manufacturing industry--65 percent--selected either [a] or [a] and [b] combined. Projects described as training for multiple industries also were weighted to preparation for high-tech fields, with four of seven selecting this choice. This compares with only one of seven projects that provided preparation for health care jobs, with five of the seven respondents selecting [b]. None of the four projects that included training for the transportation industry provided training for a high-tech field, and business service projects were about equally divided between high-tech and non-high-tech fields.

Project Clientele: Overview

One of the important goals of the Perkins Act has been to increase the access of special populations to vocational training. While the specific mandate of the Cooperative Demonstration Program with respect to special populations is ambiguous, and the grants announcement is silent on the issue, the importance of the goal to the overall Act makes it worthy of examination. The questionnaire included a number of questions designed to describe the special populations that were served through Cooperative Demonstration projects.

As noted previously, a subset of Cooperative Demonstration projects considered increased access of special populations as their most important goal. Further examination shows that these projects were also more likely to report that their project served a clientele that was new or different for the institution (see Table F-11). When asked whether the project benefitted a new or similar group of clients, three of the seven projects that selected the increased access goal as

Table F-10

PROJECTS' HIGH TECH FOCUS AND MAIN INDUSTRIES OF TRAINING (NUMBER OF PROJECTS)

Industry	Number of Projects*	a. Trained for High Tech Field	b. Trained for Using High Tech Equipment but Field Isn't	a. + b.	Other (See Text)
Construction	4	1	2	1	
Manufacturing	17	9	5	2	1
Transportation	4		3		1
Business Services	5	2	2		1
Health Care	7	1	5		1
Education		2	1		1
Multiple Industries	7	4	2		1

* Industries with fewer than four responses omitted from analysis.
* Adds to more than 27 because projects could select more than one industry.

Table F-11

PROJECTS' PRIMARY GOAL AND LIKELIHOOD OF SERVING NEW OR DIFFERENT CLIENTELES

	Clientele Benefitting From Project		
Primary Goal of Project	New or Different Group for Institution	Similar to Past Groups Served by Institution	Both
Increased Access for Special Populations (n=7)	3	0	4
Create New or Improved Training (n=15)	1	7	7
Establish Partnerships (n=3)	0	1	2
Economic Development (n=2)	1	0	1

primary also indicated that the project clientele was new or different. The other four projects with the access goal indicated that they served new groups as well as groups similar to those served in the past. None of these programs indicated that its project served a clientele entirely similar to groups served previously. By contrast, only one of the 15 projects that selected the improvement of training as its first goal also indicated that it served a new group exclusively, and seven indicated that they served groups that were entirely similar to those served in the past. An additional seven programs indicated that they served both new groups and groups similar to those served in the past.

The projects that held increased access as their primary goal were also more likely to report that they serve disadvantaged persons (see Table F-12). Comparisons of project goals with responses to the open-ended question on project clientele indicated that of the seven projects with increased access as the main goal, three characterized their primary clientele as adults seeking work in a particular field or company, three characterized their clientele as disadvantaged persons, and one indicated that it served existing employees of companies. None of the programs that saw new or improved training as their primary goal indicated that they served disadvantaged persons primarily, with seven of 15 indicating current employees as their primary clients and the majority of the rest indicating adults seeking work. Or to put it another way, three of the four program serving disadvantaged persons as their primary clients also indicated that increased access was their main goal. Seven of the 13 projects serving current employees of companies primarily indicated that new or improved training was their main goal.

Despite the rather limited number of projects that indicated they served special populations primarily, the vast majority of projects reported making specific efforts to recruit special populations (see questionnaire, item 24). All 19 projects that conducted any recruitment activities also reported such efforts, with the largest number trying to recruit women and blacks (18 projects). Hispanics and unemployed persons were a focus of recruitment efforts in 16 projects, followed by low-income persons (12 projects), and persons with

Table F-12

PROJECTS' PRIMARY GOAL AND CLIENTELES
(NUMBER OF PROJECTS)

Primary Goal of Project	Projects' Primary Clientele*			
	Current Employees	Adults Seeking Work in Fields or Company	Disadvantaged Persons	High School Students
Increased Access (n=7)	3	1	3	0
New or Improved Training (n=15)	7	5	0	3
Establish Partnerships (n=3)	1	1	1	
Economic Development (n=2)	2			

* Categories derived from open ended question.

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disabilities (11 projects). Other populations targeted by projects with less frequency included Asian or Pacific Islanders American Indians or Alaskan Natives, persons reading below the eighth grade level, immigrants, and persons living in rural areas. The methods used to recruit special populations varied, but distribution of posters, flyers, or other materials, advertisement in print or broadcast media, internal recruitment within the grantee organization/district, and contact with government offices (including PICs and employment services), were among the most popular.

Although most projects made some efforts, the four projects that indicated they served disadvantaged students were more likely to have made extra efforts to recruit these groups (see Table F-13). Interestingly, only four of the seven projects that served adults seeking work made extra efforts to attract special populations, suggesting that they may already have had a readily available source of such students. The three projects that served high school students also made efforts to attract special populations.[8]

As noted previously, business services projects were somewhat more likely to indicated that they served a new group than were projects training in manufacturing or health. It is hard to reach any conclusions about the relationship between primary clientele and industry of training, however, because only four projects identified disadvantaged persons as their primary clientele. If the definition of "disadvantaged" is broadened to include adults seeking work in a field or company, however, a pattern of relationships between industry and clientele served begins to emerge.

If projects serving disadvantaged persons and adults seeking work are combined, the survey shows that projects in areas other than manufacturing or "multiple industries" were more likely to serve these populations (see Table 4). Three of five projects providing training in business services, three of four projects with training for transportation, and five of seven offering health care training primarily served these groups (combined). On the other hand, only six of 17 projects providing training for manufacturing and three of seven that trained in multiple industries served these groups primarily.

Table F-13

PROJECTS' PRIMARY CLIENTELE AND LIKELIHOOD OF SPECIAL-POPULATION RECRUITMENT EFFORTS (NUMBER OF PROJECTS)

	Special Population Recruitment Effort	
Primary Clientele*	Yes	No
Current Employees of Companies	8	5
Adults Seeking Work in Field or Company	4	3
Disadvantaged Persons	4	0
High School Students	3	0

* Categories derived from open ended question.

The good news, then, is that the projects most likely to serve special populations were also those conducting training in fields less affected by the economic downturn. Whether this occurred by design or by default is unknown, however. Was it the initial plan of the manufacturing training projects to focus on current employees, or did projects offering this training adapt to a poor job market by serving those already employed? Did projects offering training in health care or business decide to focus on persons seeking work or disadvantaged persons because they believed jobs were available?

Projects serving adults seeking work and disadvantaged persons also appeared somewhat more likely to provide training aimed at the development of skills for entry-level work (see Table F-14). Three of the 11 projects (27 percent) aimed at the two groups combined reported providing entry-level skills training exclusively, with the eight remaining projects indicating that they provided training for both entry-level and upgraded skills. None of these projects reported providing instruction aimed exclusively at upgrading skills. Of the 13 projects serving current employees, three (23 percent) indicated that they provided entry-level skills exclusively, but four (31 percent) indicated that they provided upgrade skills exclusively. The six other projects indicated that they provided both.

Given the finding that projects serving adults seeking employment and disadvantaged persons tended to offer training in fields other than manufacturing, and the earlier finding that manufacturing projects were more likely to prepare students for work in high tech fields, it is not surprising to find that disadvantaged persons and adults seeking employment also were less likely to train for high-tech fields (see Table F-15). Of the 11 projects that emphasized these populations, seven were preparing students to use high-tech equipment or products in fields not generally considered high-tech. Only three were preparing students to work in high-tech fields, and one indicated that it was using high-tech equipment in training and providing training in basic skills. In contrast nine of 13 projects for current employees were training students for work in high tech fields or a combination of high-tech and non-high-tech fields.

Table F-14

PRIMARY CLIENTELE AND SKILL LEVELS OF TRAINING (NUMBER OF PROJECTS)

Primary * Clientele	Entry-level Skills	Upgrade Skills	Both
Current Employees of Companies	3	4	6
Adults Seeking Work in Field	1	0	6
Disadvantaged Persons	2	0	2
High School Students	2	1	0

* Categories derived from open ended questions.

Table F-15

PROJECTS' PRIMARY CLIENTELE AND HIGH TECH FOCUS
(NUMBER OF PROJECTS)

Primary* Clientele	a. Trained for High Tech Field	b. Trained for Using High Tech Equipment but Field Isn't	a. + b.	Other (See Text)
Current Employees of Companies	6	2	3	2
Adults Seeking Work in Field or Company	2	4	0	1
Disadvantaged Persons	1	3		
High School Students	2			1

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* Categories derived from open ended question.

Projects aimed at disadvantaged persons and adults seeking work also were more likely to provide non-occupation specific training in addition to occupation specific training (see Table F-16). All four projects for disadvantaged persons provided non-occupation specific training as did five of the seven projects for adults seeking work. In contrast, only five of the 13 projects for current employees provided such training. This finding may indicate that the current employees were considered by project staff to have sufficient background to pursue occupational training without additional assistance, or that the training provided was relatively narrow in scope and, hence, required little supplementary instruction.

Project Clientele: Information Drawn from Participant Counts

In addition to characterizing their overall clientele, projects were asked specific information about participants. These included participants' age, race, sex, proficiency in English, special population status, level of education attained, primary educational or vocational goal, employment status at the time of training, training status at the end of the grant period, and employment outcomes. Unfortunately, fewer than half the projects were able to supply information beyond total number of participants, sex, race, and employment status during training. The projects that failed to supply participant information also were those that claimed the largest numbers of participants. Nonetheless, some findings can be reported.

The total number of participants varied widely by site (see questionnaire, item 22). Twenty-six projects provided head count enrollments (not necessarily unduplicated) that ranged from nine to 1,589, with a median enrollment of 113 students. Only 14 projects also were able to supply FTE enrollment figures, enrollments that ranged from 19 to 517, with a median of 30 students.

Males were the largest number of training recipients (see Table F-17, and questionnaire table 1) . For the 79 percent of participants for whom sex data were provided, 67 percent were male, and 33 percent were female. Further, males were concentrated in the programs

Table F-16

PROJECTS' PRIMARY CLIENTELE AND LIKELIHOOD OF PROVIDING NON OCCUPATION-SPECIFIC INSTRUCTION

	Non-Occupationally Specific Instruction	
Primary Clientele*	Yes	No
Current Employees of Companies	5	8
Adults Seeking Work in Field or Company	5	2
Disadvantaged Persons	4	0
High School Students	2	1

* Categories derived from open ended question.

Table F-17

PARTICIPANTS BY SEX AND RACE/ETHNICITY
(NUMBERS BY SEX, PERCENTAGES BY RACE/ETHNICITY)

		Number of Participants			Race/Ethnicity					
Project Name	Total	Male	Female	Unknown	White	Black	Hispanic	Asian	American Indian	Unknown
Alabama Aviation College	517	461	46	10	75%	14%	0%	0%	0%	11%
Ben Hill-Irwin Institute	32	NA	NA	32	NA	NA	NA	NA	NA	100
Bronx Community College	NA	NA	NA	NA	NA	NA	NA	NA	NA	100
CORD	24	21	3		83	0	17	0	0	0
Clackamas Community College	1344	954	390		97	1	.8	1	1	0
Columbia Basin College	855	759	96		NA	NA	NA	NA	NA	99
Fox Valley Tech	216	183	33		99	0	0	0	1	0
Hampden County Consortium	150	119	31		49	16	19	3	3	10
Home Builders Institute	17	17	0		94	0	.6	0	0	5
Howard Community College	29	1	28		90	3	0	3	0	3
Illinois Eastern College	19	16	3		100	0	0	0	0	0
Indian Hills College	99	27	72		99	0	0	0	0	0
John M. Patterson College	102	98	4		88	12	0	0	0	0
LTV Steel Co.	28	28	0		57	21	25	0	0	0
Luzerne Community College	58	34	24		83	0	0	0	0	17
Nebraska Labor Department	39	3	36		97	0	3	0	0	0
North Clackamas Schools	59	22	37		98	0	0	0	0	2
Northampton Community College	252	148	4	100	61	0	.4	0	0	39
PAVE	255	62	193		7	85	3.5	1	0	4
State Center College District	124	108	16		56	5	29	8	0	2
Valencia Community College (Health)	486	19	467		58	5	5	5	.2	29
Valencia Community College (Tele)	603	422	181		0	0	0	0	0	100
Valencia Community College (CIM)	1076	806	270		0	0	0	0	0	100
Waubonsee Community College	172	11	161		51	21	24	4	0	0
West Virginia Northern College	1589	0	0	1589	0	0	0	0	0	100
West Virginia Department of Education 1	63	15	48		90	10	0	0	0	0
West Virginia Department of Education 2	9	7	2		100	0	0	0	0	0

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providing training in manufacturing, while females were concentrated in the programs providing training in business services and health care (see Table F-18). Although 19 programs indicated that they made special efforts to attract women, it would not appear that the projects provided a testing ground for nontraditional training by sex.

For the 21 projects reporting the race of most or all trainees, the vast majority were white (see Table F-17). In these projects, whites constituted approximately 83 percent of participants for whom race was reported, blacks were 11 percent, Hispanics were five percent, Asians were one percent, and American Indians/Alaskan Natives were less than one percent. Fewer than two percent of participants were limited English proficient. Overall, whites constituted an even greater percentage of participants in these projects than represented in the population. So, although 19 grantees said that they made special efforts to recruit minorities, among the 21 projects that supplied information, the program appears to have done little to demonstrate new opportunities for minorities. The only caveat is that the seven projects with missing data on race include about half the participants.[9]

The vast majority of trainees were employed full-time during training. Of the 87 percent of participants for whom employment status was reported, 85 percent were employed full-time during the period of training (see questionnaire table 1). Further, most of these persons were employed by the private-sector partners that cooperated in the projects. Of the 80 percent of full-time employees for whom the employer was known, 92 percent were employed by a partner company. The total percentage employed by partners was probably somewhat less than this figure, of course, because employment by the partner was more likely to be known to the grantee. Nonetheless, one can safely conclude that the main training recipients were full-time employees of partner organizations.

Understanding the employment status of the clientele makes it easier to explain the responses to a question that asked grantees to indicate the number of participants seeking various educational or vocational outcomes from the training (see questionnaire table 1).

Table F-18

FEMALE ENROLLMENT AND INDUSTRY OF TRAINING (NUMBER OF PROJECTS)

Industry of Training+	Number of Projects*	Female Enrollment is Less Than 50 Percent	Female Enrollment 50 Percent or Greater	Missing
Contruction	4	3	1	
Manufacturing	17	14	14	1
Transportation	4	3	3	
Business Services	5	2	2	
Health Care	7	1	1	1
Education	4	2	2	1
Multiple Industries	7	5	5	

+Industries with fewer than four responses omitted from analysis
*Projects add to more than 27 because projects could select more than one industry

Choices provided to respondents included job placement, job promotion, vocational certificate, high school diploma or GED, college credit, associate degree, and "other." The most popular educational outcomes for participants reported by grantees was a write-in category that indicated 36 percent of students sought specific job skills. The second most common educational goal was "unknown": 19 percent of students; followed by job promotion: 17 percent of students; and job placement: 14 percent of students. Projects reported that nine percent of project clients sought college or CEU credits. Either most students did not seek credentials or programs did not provide them and, hence, did not know whether students were seeking them. Only six percent of students were reported as seeking any credential (including a high school diploma or GED, vocational certificate, or associate degree). Combined with the findings that most participants were employed, and that mastering a set of occupational skills was one of the most popular likely "rewards" for students from the projects' perspective, these findings suggest that projects were providing forms of training tailored to very specific job requirements.

Project Activities

In order to understand how projects operated, the questionnaire asked respondents to identify the main project activities and the amounts of staff time devoted to each. Grantees were asked about activities conducted as part of project development as well as direct services to clients. The responses to these questions showed the tremendous diversity of emphases and approaches undertaken through the demonstrations. The variety of responses also points up the problems inherent in attempting to compare implementation across such disparate interventions.

Preparatory Activities. There are great ranges in relative emphasis in the activities undertaken by projects in preparation for offering services to clients. The most common preparatory activity was to identify the skills or training needed in a particular field or geographic area (see questionnaire, item 18). Twenty-two projects indicated that they carried out this activity, but the staff hours devoted to the activity ranged from 10 to 2,234. Across all projects, the mean number of hours was 272 and the median was 175. Other time-consuming start-up activities included:

- Recruiting and hiring staff (21 projects, median hours: 50);
- Development of student assessment materials (20 projects, median hours: 65);
- Recruiting students (19 projects, median hours: 100);
- Review of planned offerings by experts, potential employers or institutional officials (16 projects, median hours: 50);
- Recruiting employers interested in having employees trained or hiring students (16 projects, median hours: 85); and
- Contracting for training (15 projects, median hours: 50).

Some teacher training was undertaken in most of the projects, but the amount of training varied widely (see questionnaire, items 38 and 39). Sixteen projects indicated that they provided instructors or other staff with pre-service or in-service training in order to teach in the project. An additional eight projects reported that such training was not necessary. Two projects did not provide training, but thought in hindsight, that it would have been valuable. Pre-service training for instructors occurred in 12 projects and varied from six to 763 hours per project (number of staff trained times number of instructional hours), with a mean of 158 hours but a median of only 60 hours. In-service training occurred in 11 projects and ranged from 10 to 2,000 hours, with a mean of 357 and a median of 200 hours. What this suggests is that a few projects spent a great deal of time on pre- and in-service training, while the majority spent little.

Curriculum Development. As noted previously, five projects considered curriculum development to be their most important activity, but every project reported that it spent some time selecting a curriculum (see questionnaire, item 34). Ten projects reported that the curriculum was developed entirely by project staff, while nine said their curriculum was adapted or adopted from a curriculum already in use within the grantee institution. One project indicated that it adopted or adapted a curriculum in use at another institution, and one other adapted/adopted a curriculum already used in industry. Six projects used a combination of approaches. Given that only one project used a curriculum adopted/adapted from another institution, it would appear that replicating an approach tried elsewhere was not a major emphasis in this demonstration program.

Overall, projects devoted considerable time and effort to curriculum development (see questionnaire, item 18). Staff hours ranged from eight to 3,000, with an average of 539 but a considerably lower median number of 241 hours. Twenty-two projects indicated that, as part of curriculum development, they worked with private industry to identify training needs and skill requirements. Most also worked with industry to design the curriculum (21 projects), gain approval (19 projects), and pretest and revise the curriculum (16 projects). Five projects also consulted with union officials in developing curriculum.

As part of program development, almost all of the projects (24) sought to identify the specific job skills or qualities sought by employers (see questionnaire, item 33). To identify those skills the projects interviewed practitioners in the field (21 projects), surveyed employers (20 projects), reviewed standard or existing skill-requirement information (19 projects), observed skills at work sites (16 projects), reviewed employer job descriptions (16 projects), and conferred with experts (15 projects). In addition, nine projects reviewed previous reports and/or studies in an effort to identify the job skills or qualities employers sought.

The primary goal of the project did not appear to be a major determinant of whether the curriculum was developed anew or adapted/adopted (see Table F-19). Projects having a primary goal of improved training were somewhat more likely to develop new curricula than projects primarily concerned with increased access, but the differences were not large.

Training. In general, grant-supported training was of short duration (see questionnaire table 1). Grantees reported that 68 percent of participants received between one and 100 hours, while 11 percent received 101 and 250 hours (see Table F-20). Approximately 14 percent of participants received between 251 and 1,000 hours of training and 14 percent received 1,000 or more hours of training. There is a major caveat with respect to the hour totals, however--one that suggests that the actual number of grant-supported hours of training may be lower than these numbers reflect. Not all projects interpreted total instructional hours received through the grant in the same manner. The questionnaire instructions asked for "hours of instruction...from the project during the grant period," but it is likely that at least some projects included total instructional hours participants received, whether or not the training was project supported. For example, a project might have provided revised or additional services to an ongoing course or degree program. Some sites reported the total number of hours required to complete that course or degree program as the instructional hours received under the project. Other projects--especially those where grants largely supported separate training--reported only the portion of the course or program hours affected by a grant-supported activity or curriculum.

Attempts to obtain data on the methods of instructional delivery yielded few responses, and these reflected a wide variety of approaches. Open-ended questions that asked about the type of instruction students received (e.g., lecture, lab) and other services provided (e.g., counseling) were answered by only 13 and 11 projects, respectively, and the responses varied widely in terms of service modes (see questionnaire, item called table 1). Among the responding projects, applied learning was quite common, with some combination of laboratory and lecture formats popular.

Table F-19

PROJECTS' PRIMARY GOAL AND LIKELIHOOD OF NEW CURRICULUM DEVELOPMENT (NUMBER OF PROJECTS)

Primary Goal of Project	Curriculum Developed Entirely In-house by Project Staff	 Adapted/Adopted From Within Institution	 Adapted/Adopted From Another Institution	 Other/ Combination*
Increase Access of Special Populations	2	3	0	2
Create New or Improved Training	6	4	1	4
Establish Partnerships	0	2	0	1
Economic Development	2	0	0	0

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* See questionnaire for choices

Table F-20

PERCENTAGE OF STUDENTS RECEIVING VARIOUS AMOUNTS OF TRAINING BY INDUSTRY

Hours of Training and Percentage of Students Receiving Each Amount

Industry	Less Than 100 Hours (%)	100-250 Hours (%)	250-1,000 Hours (%)	More than 1,000 Hours (%)	Unknown (%)
Construction	72	18	10	3	0
Manufacturing	82	11	5	1	1
Transportation	48	8	11	31	1
Business Services	43	12	42	0	4
Health Care	6	12	17	63	0
Education	86	5	9	0	0
Multiple Industries	86	8	6	6	0

In addition to occupation-specific training, 16 projects included non-occupation specific instruction or training as part of their program (see questionnaire, item 31). The non-occupation-specific skills taught most often included employability skills (13 projects), basic or remedial academic skills (11 projects), or advanced academic skills (nine projects).[10]

Student Assessment. All but two projects reported that they conducted some type of student assessment, but few conducted the same assessments at entrance and later in the training (see questionnaire, item 32). The most common method was assessment of job skills, with 20 projects reporting this method. Of those 20 projects, 12 assessed job skills at entrance, and 17 assessed job skills once instruction had begun. Nine projects conducted job skill assessments both at entrance and during training. The second most common form of assessment was the administration of an academic aptitude test, which 15 projects gave at entrance. Only three of the 15 projects administered this form of test again after training had begun.

In fact, beyond job skill, the assessments favored at entrance and during training were different. As noted, the use of academic aptitude tests dropped off after entrance. In contrast, the use of criterion-referenced achievement tests increased. Seven projects administered criterion-referenced tests at entrance, but 11 administered them once training had begun. Only five projects administered criterion-referenced tests both at entrance and during training, however. Vocational aptitude tests were used by nine projects at admission, but only three projects thereafter. Eight projects administered a standardized achievement test at entrance, but only one project administered such a test thereafter. The general lack of consistency between baseline and subsequent student assessments suggests that, with the exception of nine projects that conducted baseline and follow-up assessments of job skills, projects would be unable to determine their impact on students' performance. Given that these projects were intended to be demonstrations, the built-in inability to provide evidence of effectiveness is most disheartening.

Support Services. Based on the findings from the first year of the evaluation, the study team anticipated that projects would offer participants services in addition to training. To determine the range of services, projects were asked about the types of services they offered directly, as well as those provided by another agency in coordination with the project (see questionnaire, item 20). Overall, 21 projects indicated that they provided support services directly or coordinated with another agency to provide the service.

Aside from student assessment and academic remediation, which have been discussed already, the most common services were those that involved career information. Employability advice was available in 20 projects--including 13 that provided it directly and through coordination, as well as 10 that provided it entirely through coordination. Also commonly available were career or other counseling, which 17 projects provided. Of those, 15 provided it directly, and two provided it in coordination with another agency. Three projects offered both. Job placement services were available in 16 projects, with 13 providing the service directly. The only other service available in more than half of the projects was tutoring, which was available in 15 projects and directly provided by 12. The nature of the support services overall appears to reflect the fairly job-specific focus of the projects.

Given the rather small amount of training per student and a clientele that was for the most part employed full-time, a substantial minority of projects offered students financial assistance. Eight projects indicated that they provided stipends or other financial aid directly to students.[11] Only one of these projects reported that students were eligible for financial aid through another source. Six projects said they provided students with transportation assistance directly, and one coordinated assistance. Four projects provided child care directly, and five projects offered health care directly or referral for health care.

Public/Private Cooperation

The Cooperative Demonstration Program was designed to encourage cooperation between educational institutions and the private sector. As the grants announcement noted:

> High technology training can be conducted most effectively with the active involvement and cooperation of the private sector. Effective partnerships between the private sector and public agencies in vocational education are an important aspect of the Cooperative Demonstration Program....

The announcement anticipated that the partnerships established by the project would provide models of effective cooperation. To understand the nature and extent of cooperation, the survey asked numerous questions about the projects' public/private partnerships.

Most, but not all, projects established relationships with employers (see questionnaire, item 40). Of the 27 respondents, 23 indicated some involvement of employers in planning or administering the project or in providing services. Of the remaining four projects, only one indicated that no outside partnership was formed. Some projects had multiple types of partners including schools or universities (institutions that might be employers or may be involved in the project in some other manner--19 projects) and community-based organizations (10 projects).

Although employers were involved in 23 projects, not all of these projects indicated that private businesses were the most important partner organizations (see questionnaire, item 42). Slightly more than half the projects (14 of 26) indicated that the most important partner was a private business. Of the remaining projects, five said that the most important partner was a trade association or consortium, four indicated an educational institution, and three indicated a non-educational public agency. It would appear that, in at least the five projects linked with an association or consortium, the most important private-sector partner was not an institution capable of employing persons trained by the program. For grantees that had second partners (see questionnaire, item 51), these partners were even less likely to be private businesses (nine of 20) and more likely to be trade associations (four of 20).

Although most grantees formed partnerships with only a few organizations, some established multiple partnerships (see questionnaire, item 41). Six projects had one private sector partner, and 16 projects had four or fewer, but seven projects indicated that they had 10 or more partners. Given the tremendous range in the number of partners, it is likely that the roles of partners differed considerably across the projects.

In fact, differences in partner contributions were considerable. When asked to rank in importance a list of possible activities for the most important partner organization, there was little consensus among the grantees (see questionnaire, item 44). The most commonly selected first choice activity for the partner organization was to provide equipment for training, but that choice was selected by only seven grantees. Five grantees said that the partner's main contribution was identifying job skills, while four indicated that the partner recruited students for training. Three indicated that the partner served on a project advisory committee, and two indicated that the partner supplied instructors. In short, there was considerable variability in first partner contribution--a variability that is sustained when the first- through third-ranked activities are combined. The same findings hold true for second partners, and, in fact, the variability in contribution increases (see questionnaire, item 52).

The differences in activities may be, in part, a function of the nature of the partner relationships. Based on categories developed from site visits to FY1988 grantees, the study team identified several ways to characterize or summarize the relationships between grantees and employers. Each FY1989 grantee was asked to pick the choice that best characterized its relationship with its first partner (see questionnaire, item 45). The majority of grantees selected one of two choices:

- The partner was a customer of the project, e.g., the project provided customized training to the partners' employees (selected by nine grantees); or
- The partner participated in the delivery of instruction and services (selected by nine grantees)

No other choice was selected by more than three grantees (see Table F-21). The nature of the relationship was then matched with the most important partner activity.

In most of the projects, the grant did not result in the establishment of a new primary partnership (see questionnaire, item 46). Nineteen of 27 grantees reported that the relationship between the grantee institution and the partner organization was not new, but all 19 also said that the relationship had been strengthened as a result of the project. The eight projects that did establish new relationships with the first partner organization were more likely to have encountered problems. Three of six projects that reported any problems with their first partner had new partners, and two of these partnerships were dissolved at the end of the grant.

Grantees were slightly more likely to have established new partnerships with their second partners (see questionnaire, item 54). Eight of 21 second partners were new, and appeared to reflect a wider range of relationships. Considerably fewer second partners (2) were project customers (i.e., they purchased customized training or hired students), though a sizeable number (eight) shared in delivery of instruction and services. This difference between first and second partners may have occurred because second partners were more likely to be trade associations or other educational institutions rather than employers. Second partners were somewhat more likely to serve primarily as members of advisory committees.

Grant Operations

With any Federal demonstration program, there is interest in whether funds provide an opportunity that would not otherwise have been available and do not simply substitute for existing resources. It also

Table F-21

NUMBER OF PARTNERS AND NATURE OF MOST IMPORTANT PARTNERSHIPS (NUMBER OF PROJECTS)

Nature of Partnership	1-6 Partners	7 or More Partners
Partner Was Customer of Training	4	5
Partner Served on Advisory Board	1	
Partner Provided Resources to Project	3	
Partner Participated Actively in Service Delivery	8	1
Partner Initiated Project	2	
Other	1	1
Unknown	1	

is hoped that Federal funds will provide the impetus for funding from other sources so that activities can be expanded or continued after the Federal support has ended. To address these policy issues, respondents were asked about the importance of Federal funds in project startup and development, as well as the likelihood of project continuation beyond the grant period.

In addition, based on the examination of the FY1989 grantees, there was a specific concern about the ability of grantees to start up quickly and to complete their projects. In general, the lengthy period between proposal submission and award notification, the mid-academic-year starting date for most grants, and the 18-month duration of the grant all contributed to startup and completion problems for some of the grantees. For example, when they submitted their proposals, several projects had identified persons to be hired, but those persons had taken other jobs by the time the awards were made. Finding new staff who were willing to work on a closed-end, 18-month grant took considerable time, and several FY1988 projects never had permanent project directors. In addition, the mid-academic-year startup date made creating new training classes impossible to arrange until the following fall semester, so up to 10 months elapsed before training was offered. To begin to determine the extent to which these problems persisted among FY1989 grantees, the survey asked whether the projects were able to start to provide services to clients immediately upon notification of awards and if not, how long thereafter.

Most FY1989 grantees said their projects would not have existed without Federal support (see questionnaire, item 17). Of the 27 projects, only four respondents indicated that the project would have existed without the Federal funds. Three of those were projects providing the services prior to the start of the grant. At the completion of the grant period, 14 projects expected to continue in their entirety, with another eight indicating that they would continue in a scaled-down form. Two projects reported that their Federal funding had not yet lapsed.

Projects generally began to provide direct services to clients within a few months after their grants began, but a few did not provide services for many months (see questionnaire, item 14). Excluding the three projects that were providing services to clients before the grant began, 12 projects began to provide services within three months of being awarded the grant, and nine more began within nine months. Three projects did not start, however, until 10 to 12 months after the grants were awarded (or six to eight months before the grants were originally due to end).

The grant period nonetheless appears to have been sufficient for many projects to have become institutionalized or to find other sources of support (see questionnaire, items 15 and 16). Twenty-two projects indicated they continued beyond the end of the grant. The most common sources of support among continuing projects were funds from the grantee institution (11 respondents), with private employers the second most common (eight respondents had commitments from employers and four were waiting for final agreements). Five respondents planned to charge students tuition for project services.

The ability of projects to provide services soon after receiving an award appeared to have little or no effect on whether they continued services beyond the grant period (see Table F-22). In fact, there was a slightly greater tendency for projects that began providing services last to continue, with all of the latest-starting programs continuing in their entirety after the completion of the grant. Two of the three projects that indicated they were providing services before the grant started either received extensions to December 1991, or were no longer providing services at the time of the survey.

Yet when asked directly about factors affecting their ability to complete their original plans, the short grant period was noted by the largest number of respondents (see questionnaire, items 59-61). Nine projects indicated they had encountered problems in completing their original plans. The most commonly cited reason for implementation problems was that the 18-month grant period was insufficient, a reason cited by five of these nine projects. Also noted by more than one project were difficulties in staff recruitment and/or retention (two projects) and planned activities that proved inappropriate (two projects).

Table F-22

DATE OF PROJECT START-UP AND LIKELIHOOD OF CONTINUING AFTER END OF FEDERAL GRANT
(NUMBER OF PROJECTS)

	Project Continued After Grant			
Project Provided Direct Services	In Entirety	In Scaled-Down Form	Did Not Continue	Still Funded (Extension)
Before Grant	1		1	1
As Soon As Grant Began	3	3		
1-3 Months After Award	2	3		1
4-6 Months After Award	2			
7-9 Months After Award	3	2	1	
10-12 Months After Award	3			

At the same time, however, 10 projects indicated that they had accomplished activities they had not originally planned (see questionnaire, items 62 and 63). The most commonly cited additional activity was curriculum development (five projects), followed by partner recruitment (four projects), and dissemination (three projects). Over half of these projects (six) indicated that they obtained additional funds that enabled them to undertake these unplanned activities.

The Exportability of Project Activities

Because this was a demonstration program, respondents were asked what features of their projects had applicability for or could provide useful models for other educational or employment training programs. Respondents were provided with a list of possible project features and asked to rank up to three they considered applicable or useful for others.

The projects were quite divided in choosing features of their programs that provided information for others (see questionnaire, item 12). The most commonly selected first choice was customized training for a particular employer or group of employers, which was selected by six respondents. The second most commonly selected feature, selected by five respondents, was a new or improved curriculum. "New or improved kind of training," "established or strengthened public/private partnerships" and "applied high technology equipment to the delivery of training" each received four votes. Three projects chose "expanded access to training for disadvantaged or under represented groups." Only one selected "model of school-to-work transition," which was one of the few demonstration objectives specifically identified in the grants announcement.

This wide range of responses can be read several ways. Given that this was intended to be a demonstration of public/private partnership for training in high-tech fields, the lack of consensus on exportable features is surprising. One might have expected the partnership or training choices to account for a large number of first choices, but they account for only eight of 27. The selection of customized training as a first choice is surprising, because, by its nature, customized training is rarely applicable across industries or education institutions.

If all three choices are added together, however, establishing or strengthening public/private partnerships does appear to be the feature most commonly selected as having widest applicability. Twenty projects considered partnership among the top three exportable features. Conversely, few projects that did not select customized training as a first choice selected it second or third, making it one of the lowest ranked choices overall. Partnerships was the only exportable feature identified by more than half the projects, even with first through third choices are added together.

The lack of consensus on what was being "demonstrated" is troubling. While it is not possible to reach conclusions from the responses to one question, it does seem fair to say that grantees did not share a common view of what they had used Federal support to "try out." And although all projects were, according to the grants announcement, supposed to "try out" public-private cooperation for high-tech training, only 20 projects considered their public/partnerships, and only 13 projects considered their training as applicable to or providing a useful model for others. Nonetheless, it should be noted that 25 projects undertook some activities to disseminate the curricula they used.

Notes

1. Two projects claimed that extensions to their projects made it impossible to provide needed data, but the evaluation staff indicated that final tallies of students or staff were not required. Some additional information was obtained from one nonresponding site at interviews conducted during a subsequent site visit. In order to maintain the integrity of the survey component of the analysis, however, the data summarized here are information collected from sites that returned project questionnaires prior to site visits and do not include information collected during the visits.

2. Respondents were allowed to choose as many responses as were appropriate to their project.

3. It is likely that these five were projects with more than one kind of training provided.

4. The issue of industry and special populations is discussed in greater detail under the special populations heading.

5. This final goal could be seen as an outcome of training.

6. Some projects selected third and fourth ranked goals, but the lack of such goals across all projects make these responses difficult to analyze.

7. This response probably means that the project provided computer-assisted basic skills instruction.

8. We have not discussed these projects at length because additional inquiry about these projects yielded information that suggests high school students may not have been the primary clientele served.

9. Of course, since many of these projects also report the fewest training hours per person, even if minorities were well represented they would not have received much training.

10. Although described as basic skills in this item, the instruction is described as academic remediation elsewhere in the questionnaire.

11. It is likely that this number does not include projects in which students were eligible for regular State or Federal financial aid, as an additional four projects indicated that financial aid was available through coordination.

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